CRPL-F81

IONOSPHERIC DATA

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U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
WASHINGTON, D. C.

RPL-F81

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SYMBOLS, TERMINOLOGY, CONVENTIONS

Beginning with data reported for January 1949, the symbols, terminology, and conventions for the determination of median values used in this report (CRPL-F series) conform as far as practicable to those adopted at the Fifth Meeting of the International Radio Consultative Committee (C.C.I.R.) in Stockholm, 1948, and given in detail on pages 2 to 10 of the report CRPL-F53, "Ionospheric Data," issued January 1949.

For symbols and terminology used with data prior to January 1949, see report IRPL-C61, "Report of International Radio Propagation Conference, Washington, 17 April to 5 May, 1944," previous issues of the F series, in particular, IRPL-F5, CRPL-F24, F33, F50, and report CRPL-7-1, "Preliminary Instructions for Obtaining and Reducing Manual Ionospheric Records."

Following the recommendations of the Washington (1944) and Stockholm (1948) conferences, beginning with data for January 1945, median values are published wherever possible. Where averages are reported, they are, at any hour, the average for all the days during the month for which numerical data exist.

In addition to the conventions for the determination of medians given in Appendix 5 of Document No. 293 E of the Stockholm conference, which are listed on pages 9 and 10 of CRPL-F53, the following conventions are used in determining the medians for hours when no measured values are given because of equipment limitations and ionospheric irregularities. Symbols used are those given on pages 2-9 of CRPL-F53 (Appendixes 1-4 of Document No. 293 E referred to above).

a. For all ionospheric characteristics:

Values missing because of A, B, C, F, L, M, N, Q, R, S, or T (see terminology referred to above) are omitted from the median count.

b. For critical frequencies and virtual heights:

Values of foF2 (and foE near sunrise and sunset) missing because of E are counted as equal to or less than the lower limit of the recorder. Values of h'F2 (and h'E near sunrise and sunset) missing for this reason are counted as equal to or greater than the median. Other characteristics missing because of E are omitted from the median count.

Values missing because of D are counted as equal to or greater than the upper limit of the recorder.

Values missing because of G are counted:

1. For foF2, as equal to or less than foF1.
2. For h'F2, as equal to or greater than the median.

The symbol W is included in the median count only when it replaces a height characteristic. This practice represents a change from that listed in issues previous to CRPL-F78.

Values missing for any other reason are omitted from the median count.

c. For MUF factor (M-factors):

Values missing because of G or W are counted as equal to or less than the median.

Values missing for any other reason are omitted from the median count.

d. For sporadic E (Es):

Values of fEs missing because of E or G (and B when applied to the E region only) are counted as equal to or less than the median foE, or equal to or less than the lower frequency count of the recorder.

Values of fEs missing for any other reason, and values of h'Es missing for any reason at all are omitted from the median count.

Beginning with data for November 1945, doubtful monthly median values for ionospheric observations at Washington, D. C., are indicated by parentheses, in accordance with the practice already in use for doubtful hourly values. The following are the conventions used to determine whether or not a median value is doubtful:

1. If only four values or less are available, the data are considered insufficient and no median value is computed.

2. For the F2 layer, if only five to nine values are available, the median is considered doubtful. The E and F1 layers are so regular in their characteristics that, as long as there are at least five values, the median is not considered doubtful.

3. For all layers, if more than half of the values used to compute the median are doubtful (either doubtful or interpolated), the median is considered doubtful.

The same conventions are used by the CRPL in computing the medians from tabulations of daily and hourly data for stations other than Washington, beginning with the tables in IRPL-F18.

The tables and graphs of ionospheric data are correct for the values reported to the CRPL, but, because of variations in practice in the interpretation of records and scaling and manner of reporting of values, may at times give an erroneous conception of typical ionospheric characteristics at the station. Some of the errors are due to:

a. Differences in scaling records when spread echoes are present.

b. Omission of values when foF2 is less than or equal to foFl, leading to erroneously high values of monthly averages or median values.

c. Omission of values when critical frequencies are less than the lower frequency limit of the recorder, also leading to erroneously high values of monthly average or median values.

These effects were discussed on pages 6 and 7 of the previous F-series report IRPL-F5.

Ordinarily, a blank space in the fEs column of a table is the result of the fact that a majority of the readings for the month are below the lower limit of the recorder or less than the corresponding values of foE. Blank spaces at the beginning and end of columns of h'Fl, foFl, h'E, and foE are usually the result of diurnal variation in these characteristics. Complete absence of medians of h'Fl and foFl is usually the result of seasonal effects.

The dashed-line prediction curves of the graphs of ionospheric data are obtained from the predicted zero-muf contour charts of the CRPL-D series publications. The following points are worthy of note:

a. Predictions for individual stations used to construct the charts may be more accurate than the values read from the charts since some smoothing of the contours is necessary to allow for the longitude effect within a zone. Thus, inasmuch as the predicted contours are for the center of each zone, part of the discrepancy between the predicted and observed values as given in the F series may be caused by the fact that the station is not centrally located within the zone.

b. The final presentation of the predictions is dependent upon the latest available ionospheric and radio propagation data, as well as upon predicted sunspot number.

c. There is no indication on the graphs of the relative reliability of the data; it is necessary to consult the tables for such information.

The following predicted smoothed 12-month running-average Zürich sunspot numbers were used in constructing the contour charts:

Month	Predicted Sunspot Number						
	1951	1950	1949	1948	1947	1946	1945
December		86	108	114	126	85	38
November		87	112	115	124	83	36
October		90	114	116	119	81	23
September		91	115	117	121	79	22
August		96	111	123	122	77	20
July		101	108	125	116	73	
June		103	108	129	112	67	
May		102	108	130	109	67	
April	74	101	109	133	107	62	
March	78	103	111	133	105	51	
February	82	103	113	133	90	46	
January	85	105	112	130	88	42	

WORLD-WIDE SOURCES OF IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 42 and figures 1 to 84 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL prediction of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

Commonwealth of Australia, Ionospheric Prediction Service of the Commonwealth Observatory:
- Brisbane, Australia
- Canberra, Australia
- Hobart, Tasmania

Australian Department of Supply and Shipping, Bureau of Mineral Resources, Geology and Geophysics:
- Watheroo, Western Australia

University of Graz:
- Graz, Austria

Radio Wave Research Laboratories, National Taiwan University, Taipeh, Formosa, China:
    Formosa, China

French Ministry of Naval Armaments (Section for Scientific Research):
    Dakar, French West Africa

National Laboratory of Radio-Electricity (French Ionospheric Bureau):
    Poitiers, France

Institute for Ionospheric Research, Lindau Uber Northeim, Hannover, Germany:
    Lindau/Harz, Germany

The Royal Netherlands Meteorological Institute:
    De Bilt, Holland

All India Radio (Government of India), New Delhi, India:
    Bombay, India
    Delhi, India
    Madras, India
    Tiruchy (Tiruchirapalli), India

Radio Regulatory Commission, Tokyo, Japan:
    Akita, Japan
    Tokyo (Kokubunji), Japan
    Wakkanai, Japan
    Yamagawa, Japan

Christchurch Geophysical Observatory, New Zealand Department of Scientific and Industrial Research:
    Christchurch, New Zealand
    Rarotonga, Cook Is.

Norwegian Defense Research Establishment, Kjeller per Lillestrom, Norway:
    Oslo, Norway

South African Council for Scientific and Industrial Research:
    Capetown, Union of South Africa
    Johannesburg, Union of South Africa

Post, Telephone and Telegraph Administration, Berne, Switzerland:
    Schwarzenburg, Switzerland

Research Laboratory of Electronics, Chalmers University of Technology, Gothenburg, Sweden:
    Kiruna, Sweden

United States Army Signal Corps:
    Okinawa I.

National Bureau of Standards (Central Radio Propagation Laboratory):
    Baton Rouge, Louisiana (Louisiana State University)
    Boston, Massachusetts (Harvard University)
    Guam I.
    Huancayo, Peru (Instituto Geofisico de Huancayo)
    Maui, Hawaii
    San Francisco, California (Stanford University)
    Trinidad, British West Indies
    Washington, D. C.
    White Sands, New Mexico

HOURLY IONOSPHERIC DATA AT WASHINGTON, D. C.

The data given in tables 43 to 54 follow the scaling practices given in the report IRPL-C61, "Report of International Radio Propagation Conference," pages 36 to 39, and the median values are determined by the conventions given above under "Symbols, Terminology, Conventions." Beginning with September 1949, the data are taken at Ft. Belvoir, Virginia.

IONOSPHERIC STORMINESS AT WASHINGTON, D. C.

Table 55 presents ionosphere character figures for Washington, D. C., during April 1951, as determined by the criteria given in the report IRPL-R5, "Criteria for Ionospheric Storminess," together with Cheltenham, Maryland, geomagnetic K-figures, which are usually covariant with them.

RADIO PROPAGATION QUALITY FIGURES

Table 56 gives provisional radio propagation quality figures for the North Atlantic and North Pacific areas, for 01 to 12 and 13 to 24 GCT, March 1951, compared with the CRPL daily radio disturbance warnings, which are primarily for the North Atlantic paths; the CRPL weekly radio propagation forecasts of probable disturbed periods, and the half-day Cheltenham, Maryland, geomagnetic K-figures.

The radio propagation quality figures are prepared from radio traffic and ionospheric data reported to the CRPL, in a manner basically the same as that described in IRPL-R31, "North Atlantic Radio Propagation Disturbances, October 1943 through October 1945," issued February 1, 1946. The scale conversions for each report are revised for use with the data beginning January 1948, and statistical weighting replaces what was, in effect, subjective weighting. Separate master distribution curves of the type described in IRPL-R31 were derived for the part of 1946 covered by each report; data received only since 1946 are compared with the master curve for the period of the available data. A report whose distribution is the same as the master is thereby converted linearly to the Q-figure scale. Each report is given a statistical weight which is the reciprocal

of the departure from linearity. The half-daily radio propagation quality figure, beginning January 1948, is the weighted mean of the reports received for that period.

These radio propagation quality figures give a consensus of opinion of actual radio propagation conditions as reported by the half day over the two general areas. It should be borne in mind, however, that though the quality may be disturbed according to the CRPL scale, the cause of the disturbance is not necessarily known. There are many variables that must be considered. In addition to ionospheric storminess itself as the cause, conditions may be reported as disturbed because of seasonal characteristics such as are particularly evident in the pronounced day and night contrast over North Pacific paths during the winter months, or because of improper frequency usage for the path and time of day in question. Insofar as possible, frequency usage is included in rating the reports. Where the actual frequency is not shown in the report to the CRPL, it has been assumed that the report is made on the use of optimum working frequencies for the path and time of day in question. Since there is a possibility that all disturbance shown by the quality figures is not due to ionospheric storminess alone, care should be taken in using the quality figures in research correlations with solar, auroral, geomagnetic, or other data. Nevertheless, these quality figures do reflect a consensus of opinion of actual radio propagation conditions as found on any one half day in either of the two general areas.

RELATIVE SUNSPOT NUMBERS

Table 57 lists the daily provisional Zürich relative sunspot numbers, R_Z, as communicated by the Swiss Federal Observatory. The American sunspot numbers which in the past were included in this table are now being prepared on a slower schedule and therefore do not appear in this issue.

OBSERVATIONS OF THE SOLAR CORONA

Tables 58 through 60 give the observations of the solar corona during April 1951 obtained at Climax, Colorado, by the High Altitude Observatory of Harvard University and the University of Colorado. Tables 61 through 63 list the coronal observations obtained at Sacramento Peak, New Mexico, during April 1951, derived by the High Altitude Observatory from spectrograms taken by Harvard University as a part of its performance of an Air Materiel Command Research and Development Contract administered by the Air Force Cambridge Research Laboratories. The data are listed separately for east and west limbs at 5-degree intervals of position angle north and south of the Solar Equator at the limb. The time of observation is given to the nearest tenth of a day, GCT.

Table 58 gives the intensities of the green (5303A) line of the emission spectrum of the solar corona; table 59 gives similarly the intensities of the first red (6374A) coronal line; and table 60, the intensities of the second red (6702A) coronal line; all observed at Climax in April 1951.

Table 61 gives the intensities of the green (5303A) coronal line; table 62, the intensities of the first red (6374A) coronal line; and table 63, the intensities of the second red (6702A) coronal line; all observed at Sacramento Peak in April 1951.

The following symbols are used in tables 58 through 63: a, observation of low weight; -, corona not visible; and X, position angle not included in plate estimates.

OBSERVATIONS OF SOLAR FLARES

Table 64 gives the preliminary record of solar flares reported to the CRPL. These reports are communicated on a rapid schedule at the sacrifice of detailed accuracy. Definitive and complete records are published later in the Quarterly Bulletin of Solar Activity, I.A.U., in various observatory publications, and elsewhere. The present listing serves to identify and roughly describe the phenomena observed. Details should be sought from the reporting observatory.

Reporting directly to the CRPL are the following observatories: Mt. Wilson, McMath-Hulbert, U. S. Naval, Wendelstein, Kanzel and High Altitude at Sacramento Peak, New Mexico. The remainder report to Meudon (Paris), and the data are taken from the Paris-URSIgram broadcast, monitored fairly regularly by the CRPL. The data on solar flares reported from Sacramento Peak, New Mexico, communicated by the High Altitude Observatory at Boulder, Colorado, are provided by Harvard University as the result of work undertaken on an Air Materiel Command Research and Development Contract administered by the Air Force Cambridge Research Laboratories.

The table lists for each flare the reporting observatory, date, times of beginning and ending of observation, duration (when known), total area (corrected for foreshortening), and heliographic coordinates. For the maximum phase of the flare is given the time, intensity, area relative to the total area, and the importance. The column "SID observed" is to indicate when a sudden ionosphere disturbance, noted elsewhere in these reports, occurred at the time of a flare. Times are in Universal Time (GCT).

INDICES OF GEOMAGNETIC ACTIVITY

Table 65 lists various indices of geomagnetic activity based on data from magnetic observatories widely distributed throughout the world. The indices are: (1) preliminary mean 3-hourly K-indices, Kw; (2) preliminary international character-figures, C; (3) geomagnetic planetary three-hour-range indices, Kp; (4) magnetically selected quiet and disturbed days.

Kw is the arithmetic mean of the K-indices from all reporting observatories for each three hours of the Greenwich day, on a scale 0 (very quiet) to 9 (extremely disturbed). The C-figure is the arithmetic mean of the subjective classification by all observatories of

each day's magnetic activity on a scale of 0 (quiet) to 2 (storm). The magnetically quiet and disturbed days are selected by the international scheme outlined on pages 219-227 in the December 1943 issue of Terrestrial Magnetism and Atmospheric Electricity.

Kp is the mean standardized K-index from 11 observatories between geomagnetic latitudes 47 and 63 degrees. The scale is 0 to 9, expressed in thirds of a unit, e.g., 5- is 4 2/3, 5o is 5 0/3, and 5 + is 5 1/3. This planetary index is designed to measure solar particle-radiation by its magnetic effects, specifically to meet the needs of research workers in the ionospheric field. A complete description of Kp has appeared in Bulletin 12b, "Geomagnetic Indices C and K, 1948," published in Washington, D. C., 1949, by the Association of Terrestrial Magnetism and Electricity, International Union of Geodesy and Geophysics. Tables of Kp for 1945-48 are in Bulletin 12b; for 1940-44 and 1949, in these CRPL-F reports, F65-67; for 1950, monthly in F68 and following issues. Current tables are also published quarterly in the Journal of Geophysical Research along with data on sudden commencements (sc) and solar flare effects (sfe).

The Committee on Characterization of Magnetic Disturbance, ATME, IUGG, has kindly supplied this table. The Meteorological Office, De Bilt, Holland, collects the data and compiles Kw, C and selected days. The Chairman of the Committee computes the planetary index.

SUDDEN IONOSPHERE DISTURBANCES

Tables 66, 67, 68, 69, and 70 list the sudden ionosphere disturbances observed at Ft. Belvoir, Virginia, April 1951; in England, March and April 1951; at Point Reyes, California, April 1951; at Riverhead, New York, April 1951; and at Hong Kong, China, February 1951, respectively.

Table 1

Washington, D. C. (38.7°N, 77.1°W) April 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	4.2						2.7
01	300	4.1						2.7
02	290	3.8						2.8
03	280	3.4						2.8
04	280	3.0						2.8
05	300	3.0						2.9
06	270	4.2	250	—	120	2.0		3.1
07	300	5.0	240	3.8	110	2.5		3.1
08	340	5.3	220	4.1	110	2.9		3.0
09	360	5.6	210	4.4	110	3.1		2.9
10	420	5.4	200	4.5	110	3.2		2.8
11	380	6.0	200	4.6	110	3.4		2.8
12	380	6.3	210	4.7	100	3.4		2.8
13	350	6.8	220	4.7	110	3.5		2.8
14	330	6.8	230	4.5	110	3.4		2.9
15	330	6.8	230	4.5	110	3.3		3.0
16	310	6.6	230	4.2	110	3.0		3.0
17	290	6.8	240	4.0	110	2.7		3.0
18	270	7.0	250	—	120	2.1		3.0
19	240	6.8			—	—		3.0
20	240	6.2						3.0
21	250	5.2						2.8
22	270	5.0						2.8
23	290	4.6						2.7

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 2

Kiruna, Sweden (67.8°N, 20.5°E) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(330)	3.0					4.1	
01	325	2.9					3.8	
02	(315)	2.8					2.7	
03	305	2.8					2.8	
04	300	2.4						
05	290	2.7						
06	280	3.5			---	---		
07	260	4.1	---	---	110	1.8		
08	245	4.9	220	3.5	110	2.0		
09	265	5.0	230	3.6	105	2.1		
10	280	5.4	230	3.7	110	2.3		
11	290	5.7	220	3.6	105	2.4		
12	290	5.8	220	3.7	110	2.4		
13	280	5.9	220	3.7	110	2.4		
14	260	5.8	220	3.4	110	2.2		
15	230	5.5	---	---	110	2.2		
16	240	5.2			110	1.8		
17	250	4.6			---	1.8	2.2	
18	250	4.2			---	---	2.7	
19	255	4.2					3.4	
20	260	3.5					2.9	
21	285	3.1					3.2	
22	(290)	3.0					3.5	
23	(335)	2.9					4.0	

Time: 15.0°E.
Sweep: 0.8 Mc to 15.0 Mc in 30 seconds.

Table 3

Oslo, Norway (60.0°N, 11.0°E) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	305	2.5					2.2	2.8
01	315	2.4					2.4	(2.8)
02	310	2.3					2.6	2.8
03	300	2.2					2.4	2.9
04	305	(2.0)					2.4	2.9
05	300	1.9					2.2	3.0
06	265	2.4			---	---	2.4	3.1
07	245	3.7	---	---	115	2.0		3.2
08	245	5.0	220	—	110	2.2	2.2	3.2
09	260	5.4	215	3.5	106	2.4		3.2
10	265	5.7	210	3.8	105	2.6		3.1
11	280	6.3	200	4.0	105	2.7		3.2
12	275	6.3	200	4.1	100	2.8		3.2
13	275	6.3	210	4.0	100	2.8		3.2
14	270	6.2	210	4.0	105	2.7		3.2
15	250	6.6	215	3.6	105	2.6		3.2
16	245	6.4	225	3.1	110	2.4		3.3
17	230	6.2	230	---	120	2.1		3.3
18	230	6.0			130	1.9	2.0	3.2
19	230	6.1					2.0	3.2
20	235	5.2						3.1
21	245	(4.6)						(3.1)
22	260	3.4						3.0
23	290	(2.8)						(3.0)

Time: 15.0°E.
Sweep: 1.3 Mc to 14.0 Mc in 8 minutes, automatic operation.

Table 4

De Bilt, Holland (52.1°N, 5.2°E) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.2						2.8
01	300	3.2					2.0	2.7
02	300	3.0					2.0	2.8
03	290	3.0					2.2	2.8
04	290	2.6					2.1	2.8
05	(290)	2.5					2.0	2.8
06	250	3.8	---	---	---	1.7		3.1
07	225	5.2	220	3.3	110	2.1		3.2
08	250	6.0	210	3.4	105	2.5		3.2
09	275	6.3	210	4.0	105	2.7	3.3	3.1
10	290	7.2	205	4.4	105	3.0	3.6	3.1
11	270	7.2	200	4.5	105	3.0		3.2
12	290	7.2	200	4.5	105	3.1		3.1
13	290	7.4	210	4.4	105	3.1		3.2
14	280	7.6	216	4.3	105	3.0		3.2
15	270	7.4	220	4.0	105	2.8		3.1
16	240	7.0	230	3.5	110	2.4		3.2
17	240	6.9	---	---	115	2.0		3.2
18	220	6.9		---	---	1.4		3.1
19	230	6.1						3.1
20	225	5.3						3.1
21	255	4.2						2.9
22	285	3.7						2.8
23	300	3.4						2.8

Time: 0.0°.
Sweep: 1.4 Mc to 16.0 Mc in 7 minutes, automatic operation.

Table 5

Graz, Austria (47.1°N, 15.5°E) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05	280	2.9						
06	280	3.5						
07	230	5.2						
08	220	6.3		(3.4)	110	2.8	3.5	
09	250	6.9	200	4.0	110	2.9	3.6	
10	280	7.7	200	4.3	110	3.2	3.7	
11	280	7.6	200	4.5	110	3.2	3.5	
12	280	7.6	200	4.5	110	3.3	3.7	
13	280	7.4	200	4.4	100	3.3	3.7	
14	280	7.3	200	4.2	110	3.2	3.6	
15	250	7.2	210	(3.9)	110	3.0	(3.6)	
16	240	7.5	(220)			(2.7)	(3.5)	
17	240	7.3					(3.5)	
18	230	7.0						
19	250	6.3						
20	250	4.6						
21								
22								
23								

Time: 15.0°E.
Sweep: 2.6 Mc to 12.0 Mc in 2 minutes.

Table 6

Boston, Massachusetts (42.4°N, 71.2°W) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	3.2						3.0
01	280	3.0						3.0
02	280	2.8						2.9
03	270	(2.9)						(3.0)
04	280	2.8						3.0
05	290	2.6						3.0
06	230	3.4			---	---		3.3
07	220	4.8	---	---	110	2.3		3.4
08	220	5.6	200	3.8	110	2.6		3.3
09	250	6.0	190	3.9	100	2.8		3.3
10	270	6.4	180	4.0	100	2.9		3.3
11	280	6.7	190	4.2	100	3.1		3.3
12	290	6.7	200	4.4	100	3.1		3.2
13	280	6.9	200	4.3	110	3.1		3.2
14	280	6.9	210	4.2	110	3.0		3.2
15	270	7.0	210	4.0	110	2.8		3.2
16	250	6.8	220	3.7	110	2.6		3.2
17	220	6.9	---	---	120	2.3		3.4
18	210	6.6						3.3
19	220	6.9						3.3
20	230	6.6						3.2
21	240	4.6						3.2
22	260	3.9						3.0
23	280	(3.6)						(3.0)

Time: 76.0°W.
Sweep: 0.8 Mc to 15.0 Mc in 1 minute.

Table 7

San Francisco, California (37.4°N, 122.2°W) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.7						2.9
01	300	(3.7)						(2.9)
02	300	(3.6)						(2.9)
03	300	(3.7)						(2.9)
04	290	3.6						2.9
05	300	(3.2)						(2.9)
06	300	3.8						3.0
07	250	5.4						3.2
08	260	7.2	240	3.7	130	2.5		3.2
09	260	7.6	---	4.3	120	(2.9)		3.1
10	290	7.8	220	4.5	120	---		3.0
11	300	8.5	220	4.7	120	---		2.9
12	290	9.2	220	4.8	120	---		3.0
13	290	8.6	---	4.8	120	---		3.0
14	280	8.4	230	4.6	120	---		3.1
15	280	8.2	---	4.4	120	---		3.1
16	260	7.6	---	4.0	120	---		3.2
17	250	7.6	---	3.7	120	2.4		3.3
18	240	6.8						3.3
19	240	5.1						3.2
20	250	4.4						3.1
21	280	3.9						3.0
22	280	(3.8)					2.2	(2.9)
23	300	(3.7)						(2.8)

Time: 120.0°W.
Sweep: 1.3 Mc to 18.0 Mc in 4 minutes.

Table 8

White Sands, New Mexico (32.3°N, 106.5°W) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	3.6						2.8
01	280	3.6						2.9
02	280	3.7						2.9
03	260	3.7						3.0
04	250	3.6						3.0
05	250	3.4						3.0
06	260	3.8			---	---		3.0
07	240	5.7	230	---	110	2.0		3.3
08	250	6.8	220	---	110	2.6		3.2
09	270	7.6	210	4.2	110	2.9		3.2
10	290	8.2	200	4.6	100	3.1		3.1
11	290	8.6	200	4.7	100	3.2		3.0
12	290	9.5	210	4.8	110	3.4		3.0
13	280	9.6	220	4.8	100	3.4		3.0
14	280	9.3	220	4.6	110	3.3		3.1
15	270	8.8	220	4.4	110	3.1		3.2
16	250	8.6	230	---	110	2.8		3.2
17	240	8.2	230	---	110	2.3	2.4	3.3
18	220	7.1			---	---	2.5	3.3
19	220	5.6					2.3	3.2
20	230	4.3					2.1	3.1
21	(250)	3.9					1.9	3.0
22	(270)	3.8						2.9
23	(280)	3.8						2.9

Time: 105.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 9

Okinawa I. (26.3°N, 127.8°E) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	5.3						2.9
01	250	5.1						2.9
02	240	4.9						3.1
03	220	4.6						3.2
04	230	3.2						3.0
05	250	3.0						3.0
06	260	3.6						3.1
07	230	6.6			110	2.2		3.3
08	260	8.0	230	---	110	2.8		3.2
09	280	9.4	220	---	110	3.1		3.1
10	280	10.8	220	---	110	(3.3)	3.2	3.1
11	300	11.9	220	---	110	3.4	3.3	3.0
12	290	13.2	220	---	110	3.4	3.6	3.0
13	280	14.2	220	---	110	3.5	3.3	3.1
14	270	14.2	220	---	110	3.4	3.6	3.1
15	260	14.1	220	---	110	3.2	2.9	3.1
16	250	12.4	230	---	110	2.9	3.5	3.1
17	240	11.1	230	---	110	2.4	3.3	3.2
18	230	10.2			---	---	2.2	3.2
19	220	8.7					1.9	3.2
20	220	7.2						(3.0)
21	250	6.6						2.8
22	280	6.2						2.9
23	280	5.8						2.9

Time: 127.5°E.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 10

Maui, Hawaii (20.8°N, 156.5°W) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	4.5					1.8	3.0
01	260	3.7					1.5	3.0
02	260	3.5						3.0
03	250	3.0						3.1
04	270	2.8						3.0
05	270	2.5						2.9
06	280	2.4					1.7	2.7
07	250	5.4	---	---	130	1.9		3.3
08	250	7.3	240	---	120	2.6		3.2
09	280	8.7	220	3.7	120	3.0	5.3	3.0
10	300	10.0	220	(4.7)	110	3.2	4.7	2.9
11	310	11.0	320	(4.9)	110	3.4	4.8	2.9
12	310	12.0	220	4.9	120	3.5	4.6	2.8
13	320	12.5	210	(4.9)	110	3.5	4.4	2.9
14	300	13.0	220	4.8	110	3.4	4.6	3.0
15	290	13.0	230	(4.7)	110	3.3	4.8	3.0
16	280	12.3	230	4.4	120	3.0	4.3	3.0
17	250	11.7	240	---	120	2.6	3.5	3.2
18	240	10.0	---	---	120	1.9	3.7	3.3
19	230	8.1					3.7	3.2
20	230	6.6					2.1	3.0
21	240	6.1					2.0	3.0
22	280	4.9					2.1	2.7
23	270	4.5					2.1	2.9

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 11

Guam I. (13.6°N, 144.9°E) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	240	9.8					3.0	3.2
01	230	9.2					2.1	3.3
02	230	7.9						3.4
03	230	5.9						3.3
04	230	4.8					1.5	3.3
05	240	3.7					2.3	3.3
06	250	3.0					2.9	3.2
07	250	6.2			130	2.0	3.6	3.3
08	(260)	8.2	230	---	110	2.7	3.8	3.2
09	280	9.6	220	---	110	3.0	4.1	2.8
10	300	10.5	210	4.6	110	3.3	4.1	2.4
11	310	10.1	200	4.7	110	3.4		2.5
12	310	10.0	200	4.8	110	3.5		2.4
13	310	10.2	200	4.8	110	3.5		2.4
14	310	11.0	200	4.7	110	3.4		2.5
15	310	11.7	210	---	110	3.2		2.7
16	290	12.6	230	---	110	3.0	3.8	2.9
17	(270)	12.6	240	---	120	2.7	4.2	2.9
18	250	12.7			130	2.0	4.0	2.9
19	280	12.5					3.5	2.8
20	300	12.1					2.6	2.7
21	260	11.6					1.8	2.9
22	240	11.1					1.9	2.9
23	230	10.4					1.8	3.0

Time: 150.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 12

Trinidad, British West Indies (10.7°N, 61.6°W) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	6.0						3.0
01	250	5.8						3.2
02	230	5.4						3.2
03	220	4.8						3.3
04	250	3.8						3.1
05	270	3.2						2.9
06	270	3.5						3.1
07	220	6.0	---	---	120	2.2	3.0	3.5
08	240	7.3	220	4.2	110	2.8	3.4	3.4
09	260	8.5	220	4.6	110	3.2	3.8	3.2
10	280	10.0	220	5.0	100	3.6	4.2	3.1
11	280	11.1	200	5.0	100	3.7	4.3	3.1
12	280	11.5	200	5.0	100	3.8	4.3	3.1
13	280	11.8	200	5.0	100	3.8	4.4	3.1
14	270	12.0	200	4.9	100	3.6	4.4	3.1
15	270	12.0	200	4.7	100	3.4	4.4	3.1
16	250	11.5	220	4.3	110	3.1	4.3	3.2
17	240	10.6	220	3.8	110	2.6	3.6	3.2
18	230	9.9			---	---	3.0	3.2
19	230	8.7					2.2	3.2
20	230	8.1						3.0
21	240	7.3						2.9
22	270	6.2						2.8
23	280	6.0						2.9

Time: 60.0°W.
Sweep: 1.2 Mc to 19.5 Mc, manual operation.

Table 13

Huancayo, Peru (12.0°S, 75.3°W) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	220	8.9					3.5	3.2
01	220	8.0					3.7	3.1
02	230	6.3					3.7	3.2
03	250	5.6					3.5	3.2
04	260	5.0					3.2	3.2
05	280	4.5					3.1	3.2
06	280	4.9			110	---	3.2	3.1
07	250	8.0			100	2.5	4.1	3.3
08	280	9.9	220	---	110	3.0	7.5	3.1
09	300	10.8	220	(4.8)	110	3.2	10.5	2.8
10	300	10.4	210	4.8	110	(3.5)	10.8	2.4
11	320	10.1	210	4.9	110	(3.6)	10.6	2.5
12	320	9.2	210	4.8	110	(3.6)	10.7	2.5
13	320	9.2	210	4.8	110	(3.6)	10.6	2.5
14	300	9.4	210	4.7	110	(3.6)	10.7	2.5
15	300	9.9	210	---	110	(3.5)	10.6	2.5
16	220	10.2	200	---	110	(2.9)	10.3	2.5
17	260	9.9			100	2.4	8.0	2.5
18	280	9.9			110	---	3.2	2.5
19	320	9.0					2.9	2.4
20	310	9.2					3.1	2.5
21	280	9.6					3.0	2.8
22	230	9.1					3.2	3.0
23	230	9.2					3.2	3.0

Time: 75.0°W.
Sweep: 16.0 Mc to 0.5 Mc in 15 minutes, automatic operation.

Table 14

Kiruna, Sweden (67.8°N, 20.5°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(300)	(3.4)					4.2	
01	(305)	3.4					3.7	
02	(280)	3.6					3.7	
03	280	2.9					2.6	
04	280	3.3					2.4	
05	260	2.9						
06	270	2.5						
07	260	3.0						
08	250	4.1			---	---		
09	240	4.7			---	---		
10	240	5.4	---	---	---	2.0		
11	240	5.8	---	---	---	2.1		
12	240	6.0	---	---	---	---		
13	240	6.3	---	---	---	---		
14	240	5.6			---	1.9		
15	240	5.2			---	---		
16	230	4.1					1.0	
17	225	3.6					2.0	
18	250	3.3					2.8	
19	(255)	3.4					3.9	
20	(275)	(3.1)					4.2	
21	(290)	3.2					4.2	
22	---	(3.0)					4.2	
23	---	(3.3)					4.1	

Time: 15.0°E.
Sweep: 0.8 Mc to 15.0 Mc in 30 seconds.

Table 15

Graz, Austria (47.1°N, 15.5°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05								
06								
07	250	4.2						
08	230	5.8						
09	220	7.2	(220)	(3.9)				
10	220	8.0	210	3.8				
11	220	7.9	210	4.3			3.0	
12	250	7.7	210	4.3			3.1	
13	250	7.8	210	4.3			3.0	
14	230	7.6	210	4.0				
15	220	7.6						
16	220	7.5						
17	210	6.9					3.3	
18	220	5.7					3.3	
19	250	4.6						
20	---	---						
21								
22								
23								

Time: 15.0°E.
Sweep: 2.5 Mc to 12.0 Mc in 2 minutes.

Table 16

Schwarzenburg, Switzerland (46.8°N, 7.3°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	3.2						
01	300	3.1						
02	300	3.1						
03	300	3.0						
04	310	2.9						
05	300	2.7						
06	300	2.2						
07	300	2.9			---	---		
08	250	4.8			110	1.8		
09	230	6.5			100	2.1		
10	230	7.0			100	2.5		
11	230	7.0			100	2.7		
12	220	7.5			100	2.9		
13	220	7.6			100	2.8		
14	220	7.5			100	2.8		
15	230	7.5			100	2.6		
16	240	7.5			100	2.4		
17	230	7.0			110	2.0		
18	220	6.5			100	1.8		
19	230	5.0						
20	250	4.3						
21	300	3.5						
22	300	3.1						
23	300	3.0						

Time: 15.0°E.
Sweep: 1.0 Mc to 25.0 Mc, automatic operation.

Table 17

Wakkanai, Japan (45.4°N, 141.7°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.5						2.8
01	300	3.4						2.8
02	300	3.4						2.8
03	300	3.5						2.9
04	280	3.4						3.0
05	280	3.3						2.9
06	250	3.6						3.0
07	230	5.8	---	---	110	1.7		3.2
08	240	7.5	---	---	110	2.2		3.2
09	250	8.5	240	---	110	2.6		3.2
10	270	8.7	250	---	110	2.9		3.2
11	270	9.2	250	---	110	2.9		3.2
12	260	8.8	250	---	110	3.0		3.2
13	260	8.5	230	---	110	3.0		3.3
14	260	8.1	230	---	110	2.9		3.3
15	250	7.6	---	---	110	2.6		3.3
16	250	7.1	---	---	110	2.3		3.2
17	230	6.2	---	---	100	1.7		3.2
18	240	5.4					1.6	3.1
19	240	4.6						3.2
20	280	4.0						3.0
21	290	3.8						3.0
22	300	3.6						2.9
23	300	3.7						2.8

Time: 135.0°E.
Sweep: 1.0 Mc to 17.0 Mc in 15 minutes, manual operation.

Table 18

Akita, Japan (39.7°N, 140.1°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	3.8						2.9
01	280	3.6						2.9
02	280	3.7						2.9
03	270	3.4						2.9
04	260	3.5						3.0
05	270	3.4						2.9
06	270	3.3						3.1
07	230	5.8	---	---	130	1.9		3.4
08	230	7.7	---	---	120	2.4		3.4
09	240	8.7	230	---	110	2.8		3.4
10	250	9.6	230	---	120	3.0		3.3
11	250	9.9	230	---	120	---		3.3
12	250	9.3	240	---	110	---		3.4
13	250	8.8	230	---	120	3.0		3.3
14	240	8.5	220	---	110	3.0		3.3
15	240	8.0	220	---	120	2.8		3.4
16	240	7.7	---	---	120	2.4		3.4
17	230	6.6			120	1.9		3.3
18	230	5.8					1.9	3.2
19	240	5.1						3.2
20	250	4.2					2.0	3.2
21	270	3.8						3.0
22	280	3.8						3.0
23	290	3.8						2.9

Time: 135.0°E.
Sweep: 1.0 Mc to 17.0 Mc in 15 minutes, manual operation.

Table 19

Tokyo, Japan (35.7°N, 139.5°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	3.8					1.8	2.9
01	260	3.7					1.6	3.0
02	250	3.8					1.8	3.0
03	260	3.3					1.6	3.0
04	250	3.1					1.5	3.0
05	270	3.0						2.9
06	260	3.0						3.0
07	240	6.1	---	---	120	1.6		3.4
08	240	7.5	230	---	110	2.4		3.4
09	250	9.0	230	---	110	2.9		3.2
10	260	10.3	230	---	100	3.2		3.2
11	260	10.1	230	---	100	3.3		3.3
12	250	10.3	240	---	110	3.4		3.3
13	260	8.6	220	---	100	3.2		3.3
14	250	8.4	230	---	110	3.2		3.3
15	250	8.0	230	---	110	2.9		3.3
16	250	7.5	240	---	110	2.5		3.4
17	220	8.9	---	---	110	1.8	2.5	3.3
18	230	5.8					2.4	3.3
19	230	5.0					2.0	3.2
20	240	4.3					2.2	3.2
21	250	3.8					2.2	3.0
22	270	3.6					1.9	3.0
23	280	3.8					1.6	2.8

Time: 135.0°E.
Sweep: 1.0 Mc to 18.5 Mc in 2 minutes.

Table 20

Yamagawa, Japan (31.2°N, 130.6°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	3.8					1.7	3.0
01	290	3.6						2.9
02	270	3.5						3.0
03	270	3.5						3.1
04	260	3.2						3.0
05	270	2.8						3.0
06	300	2.6						2.9
07	280	4.2	---	---	---	E		3.1
08	250	7.2	230	---	110	2.2		3.4
09	250	8.4	230	---	110	2.7	3.3	3.3
10	280	9.2	220	---	110	3.0	3.6	3.2
11	280	11.7	230	---	100	3.3	4.0	3.2
12	270	11.7	220	---	100	3.5	4.4	3.3
13	270	10.6	220	---	110	3.4	4.1	3.2
14	270	10.2	230	---	100	3.4	4.3	3.2
15	270	9.6	230	---	110	3.2	4.0	3.3
16	260	8.9	230	---	110	2.7	3.8	3.3
17	250	8.5	240	---	110	2.4	3.8	3.3
18	230	7.2	---	---	110	1.7	2.6	3.4
19	230	6.0					2.6	3.3
20	240	5.4					2.2	3.2
21	240	4.8						3.2
22	260	4.0						3.0
23	290	3.9						3.0

Time: 135.0°E.
Sweep: 1.0 Mc to 18.5 Mc in 15 minutes, manual operation.

Table 21

Baton Rouge, Louisiana (30.5°N, 91.2°W) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	330	(3.6)						(2.8)
01	310	3.8						2.8
02	320	3.8						2.9
03	310	(3.8)						(2.8)
04	300	3.8						2.9
05	320	3.6						2.9
06	320	3.6						2.8
07	270	5.6						3.2
08	270	7.0	250	---	130	---		3.2
09	290	7.7	240	---	130	---		3.1
10	290	8.6	250	---	120	---		3.0
11	300	8.9	240	---	120	---		2.9
12	310	9.3	250	(4.8)	(120)	---		2.9
13	320	9.4	250	(4.8)	120	---		2.9
14	300	9.4	260	(4.6)	(120)	---		3.0
15	290	8.7	260	---	120	---		2.9
16	290	8.8	270	---	130	---		3.0
17	270	8.4						3.2
18	250	6.8						3.1
19	270	5.5						3.2
20	290	4.1						3.0
21	300	(3.5)						2.8
22	320	3.2						2.8
23	340	(3.5)						(2.7)

Time: 90.0°W.
Sweep: 2.05 Mc to 14.3 Mc in 5 minutes, automatic operation.

Table 22

Formosa, China (25.0°N, 121.0°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(240)	(4.6)						(3.7)
01	(240)	(4.6)						(3.8)
02	(235)	(4.2)						(3.8)
03	(280)	(3.6)			---	---		(3.5)
04	(280)	(3.6)			---	---		(2.8)
05	(250)	(3.8)	---	---	---	---		(2.5)
06	280	3.0	---	---	---	---		3.5
07	240	6.3	210	4.1	---	---		3.7
08	230	8.9	200	4.2	100	3.0	3.1	3.9
09	240	9.7	200	4.5	100	3.0	3.5	2.7
10	245	12.4	200	4.6	100	3.1	4.2	3.6
11	240	13.4	200	4.7	100	3.4	4.6	3.6
12	245	13.8	200	5.0	100	3.4	4.8	3.5
13	265	13.0	200	4.9	100	3.4	4.4	3.5
14	260	13.8	200	4.6	100	3.2	4.3	3.5
15	250	12.3	210	4.6	100	3.3	4.2	3.4
16	240	12.2	210	4.1	100	3.4	3.8	3.8
17	220	11.3	210	3.9	100	3.2	3.1	3.7
18	240	11.0	---	---	---	---		3.3
19	240	10.5	---	---	---	---		3.5
20	(200)	(7.6)	---	---				(4.0)
21	(200)	(7.2)	---	---				(3.7)
22	(215)	(6.6)	---	---				(3.7)
23	(230)	(6.7)						(3.3)

Time: 120.0°E.
Sweep: 2.3 Mc to 14.5 Mc in 15 minutes, manual operation.

Table 23

Johannesburg, Union of S. Africa (26.2°S, 28.1°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	4.4						2.9
01	250	4.2					1.8	3.0
02	250	3.8					2.1	3.0
03	260	3.5					1.8	2.9
04	260	3.0						3.0
05	260	2.8					1.6	2.9
06	260	4.1			140	1.7		3.1
07	270	5.8	240	---	120	2.4		3.1
08	300	6.6	230	4.4	110	2.9	3.6	2.9
09	330	7.4	220	4.6	110	3.3	4.0	2.8
10	340	8.0	210	4.8	110	3.4	4.2	2.8
11	330	8.9	210	4.8	110	3.6	4.2	2.8
12	320	9.2	210	4.9	110	3.7	4.0	2.9
13	320	9.0	210	4.8	110	3.7	4.0	2.8
14	320	8.6	210	4.8	110	3.6	3.8	2.9
15	300	8.5	210	4.7	110	3.5	4.0	3.0
16	300	8.0	220	4.5	110	3.2	4.0	3.0
17	280	7.2	230	(4.0)	120	2.9	3.5	3.1
18	250	7.0	240	---	120	2.2	3.0	3.2
19	240	6.6			---	---	1.8	3.1
20	240	6.0					2.0	3.0
21	250	5.1					2.0	3.0
22	260	4.8					2.1	2.9
23	280	4.4					2.0	2.8

Time: 30.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 24

Capetown, Union of S.Africa (34.2°S, 18.3°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	4.0						2.8
01	280	3.6					1.6	2.8
02	270	3.6					1.8	2.9
03	270	3.3					2.1	2.9
04	270	3.2					2.1	2.9
05	290	3.0					2.0	2.8
06	280	3.1			---	E		[illegible]
07	250	5.0	260	---	120	2.0		3.1
08	300	5.8	240	4.1	120	2.6		3.0
09	340	6.6	230	4.4	110	3.0	3.5	2.8
10	350	7.2	220	4.6	110	3.2	3.8	2.8
11	340	8.0	220	4.8	110	3.4	4.0	2.8
12	330	8.4	210	4.8	110	3.5	4.0	2.8
13	340	8.4	210	4.9	110	3.6	3.9	2.8
14	340	8.2	310	4.8	110	3.6	3.9	2.8
15	330	8.1	220	4.9	110	3.4	3.7	2.9
16	310	8.1	220	4.6	110	3.2	3.8	2.9
17	290	7.2	230	4.3	120	3.1	3.6	3.0
18	270	6.6	230	3.9	120	2.7	3.2	3.1
19	250	8.2	250	---	120	3.0	3.4	3.1
20	240	6.0						3.1
21	240	5.1						3.0
22	250	4.0						3.0
23	280	4.0						3.0

Time: 30.0°E.
Sweep: 1.[illegible] Mc to 15.0 Mc in 7 seconds.

Table 25

Kiruna, Sweden (67.8°N, 20.5°E) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	---	(3.6)					4.4	
01	(300)	3.6					3.6	
02	(295)	3.3					3.3	
03	280	3.4					2.4	
04	270	3.1					2.5	
05	260	2.8						
06	250	2.6						
07	(260)	2.3						
08	250	2.6						
09	230	4.0						
10	220	4.9			105	1.9		
11	215	5.6			100	2.0		
12	220	6.1			100	2.1		
13	210	5.8			---	---		
14	210	5.3			---	---		
15	220	4.3						
16	240	3.2						
17	(260)	3.5					2.3	
18	---	(3.0)					3.9	
19	---	(3.7)					4.3	
20	(280)	(3.1)					4.2	
21	---	(2.9)					4.4	
22	---	(4.1)					5.0	
23	---	(3.9)					4.4	

Time: 15.0°E.
Sweep: 0.8 Mc to 15.0 Mc in 30 seconds.

Table 26

Lindau/Harz, Germany (51.6°N, 10.1°E) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	2.8					2.2	2.9
01	280	2.9					2.4	2.8
02	280	2.9					2.4	2.8
03	260	2.8					2.6	2.9
04	260	2.6					2.4	2.9
05	250	2.4					2.4	3.0
06	250	2.0					2.5	3.0
07	280	2.0					2.4	3.0
08	230	3.9					2.8	3.2
09	210	6.0			110	1.8	3.3	3.4
10	210	6.8			100	2.2	3.5	3.4
11	210	7.4			100	2.4	3.6	3.4
12	210	7.8			100	2.6	4.6	3.4
13	210	7.2			100	2.5	5.0	3.4
14	220	6.8			110	2.4	4.0	3.4
15	210	6.6			110	2.1	3.5	3.4
16	210	6.1			120	1.7	3.3	3.4
17	210	5.5					2.8	3.3
18	210	4.3					2.3	3.2
19	220	3.4					2.3	3.2
20	260	2.8					1.8	3.0
21	290	2.8					2.0	2.9
22	290	2.8					2.0	2.9
23	290	2.8					2.4	2.7

Time: 15.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 8 minutes.

Table 27

Schwarzenburg, Switzerland (46.8°N, 7.3°E) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	3.4						
01	300	3.2						
02	290	3.3						
03	280	3.5						
04	250	3.3						
05	230	2.9						
06	250	2.6						
07	270	2.5						
08	220	4.2			---	---	2.1	
09	200	6.1			110	2.2		
10	210	7.3			100	2.4		
11	220	8.0			100	3.7		
12	200	7.6			100	2.8		
13	210	7.5			100	2.8		
14	220	7.4			100	2.7		
15	220	7.0			100	2.5		
16	210	6.5			100	2.2		
17	210	6.2			110	1.9		
18	210	4.7			---	---		
19	220	4.0						
20	240	3.7					2.4	
21	260	3.3						
22	300	3.2						
23	300	3.2						

Time: 15.0°E.
Sweep: 1.0 Mc to 25.0 Mc, automatic operation.

Table 28

Watheroo, W. Australia (30.3°S, 115.9°E) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	5.5					4.7	2.9
01	260	4.9					4.8	2.9
02	250	4.4					4.0	2.9
03	250	3.9					3.6	2.9
04	260	3.6					3.3	2.9
05	270	3.4					2.8	2.8
06	250	4.5	260	3.3		1.9	3.4	3.1
07	310	5.0	230	4.1		2.6	3.8	3.1
08	350	5.5	230	4.4		3.1	4.5	2.9
09	380	5.8	210	4.6		3.3	4.5	2.8
10	380	6.4	220	4.7		3.5	5.4	2.9
11	360	7.4	200	4.8		3.6	5.7	2.8
12	350	7.4	200	4.8		3.7	4.8	2.8
13	350	7.6	210	4.8		3.6	4.5	2.9
14	340	7.4	200	4.8		3.6	4.6	2.9
15	330	7.3	210	4.7		3.4	4.6	2.9
16	320	7.0	230	4.5		3.3	4.6	3.0
17	300	6.5	220	4.3		3.0	4.0	3.0
18	260	6.2	230	3.7		2.5	4.0	3.1
19	250	6.0					3.2	3.1
20	250	6.2					3.4	3.0
21	260	6.0					3.6	2.9
22	290	5.4					3.6	2.9
23	290	5.7					4.2	2.9

Time: 120.0°E.
Sweep: 16.0 Mc to 0.5 Mc in 15 minutes, automatic operation.

Table 29

Schwarzenburg, Switzerland (46.8°N, 7.3°E) December 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.3						
01	260	3.4						
02	360	3.4			---	---		
03	270	3.2			---	---		
04	260	3.0			---	---		
05	260	2.7			---	---		
06	250	3.0			---	---		
07	230	2.8			---	---		
08	210	4.1			---	---		
09	200	6.1			110	2.2		
10	200	7.0			100	2.5		
11	210	7.7			100	2.7		
12	210	7.6			100	2.8		
13	200	7.4			100	2.7		
14	210	7.5			100	2.8		
15	210	7.1			110	2.4		
16	200	6.4			110	2.2		
17	200	5.6			100	2.0		
18	200	4.1			---	---		
19	220	3.8			---	---		
20	240	3.4						
21	250	3.2						
22	280	3.2						
23	300	3.0						

Time: 15.0°E.
Sweep: 1.0 Mc to 25.0 Mc, automatic operation.

Table 30

Rarotonga I. (21.3°S, 159.8°W) December 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	8.3					3.9	3.0
01	280	7.7					3.9	3.0
02	300	8.5					3.2	3.7
03	300	8.0					2.8	3.8
04	310	8.1						2.8
05	320	5.8					3.6	2.8
06	260	6.8					3.5	2.8
07	260	8.9	240	5.1	110	2.6	5.0	3.0
08	300	9.2	240	4.8	110	3.2	5.2	3.0
09	330	9.5	220	5.6	110	3.5	5.2	2.8
10	350	10.4	220	5.5	100	3.7	5.2	2.8
11	350	11.4	220	5.4	110	3.7	5.1	2.8
12	340	11.8	240	5.4	110	3.8	5.0	2.8
13	350	12.8	250	5.4	110	3.8	5.0	2.9
14	320	13.1	320	5.1	110	3.6	4.6	3.9
15	310	13.4	220	4.9	110	3.5	4.6	2.9
16	320	11.0	250	5.0	110	3.3	4.6	2.9
17	300	11.4	240	4.8	110	3.1	4.8	2.9
18	280	9.8	---	---	---	---	5.0	3.9
19	270	9.5					5.0	3.0
20	300	9.1					5.0	2.9
21	300	8.4					5.0	2.9
22	290	8.2					4.7	3.0
23	300	8.0					4.0	3.0

Time: 157.5°W.
Sweep: 2.0 Mc to 16.0 Mc, manual operation.

Table 31

Christchurch, New Zealand (43.6°S, 172.7°E) December 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	6.4					3.3	2.8
01	280	5.8					3.1	2.8
02	270	5.5					3.4	2.8
03	270	4.6					2.9	2.8
04	280	4.2				---	3.0	2.8
05	260	4.6	260	3.0		1.8	3.0	3.0
06	300	6.0	260	3.8		2.4	3.4	3.0
07	320	5.7	240	4.4		2.8	4.2	3.0
08	350	6.2	---	4.6		3.2	4.9	2.9
09	330	6.8	220	4.7		3.3	5.8	3.0
10	360	7.0	220	4.9		3.4	6.0	2.9
11	350	7.3	210	4.9		3.5	6.0	2.9
12	340	7.2	220	4.8		3.4	6.0	2.9
13	340	7.0	220	4.9		3.4	4.4	2.9
14	340	6.9	220	4.8		3.4	3.7	2.9
16	330	6.9	230	4.7		3.4		3.0
16	330	7.2	240	4.5		3.2	3.7	2.9
17	310	7.2	240	4.2		2.8	3.8	2.9
18	280	7.2	250	3.7		2.4	3.6	3.0
19	270	7.5	---	3.0		1.6	4.2	2.9
20	260	7.7					3.9	2.8
21	270	7.5					3.6	2.7
22	280	7.1					3.5	2.7
23	280	6.6					3.3	2.7

Time: 172.6°E.
Sweep: 1.0 Mc to 13.0 Mc.

Table 32

Barotonga I. (21.3°S, 159.8°W) November 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	7.5					3.2	3.0
01	300	7.3					3.0	3.1
02	250	6.6					2.6	3.2
03	300	6.0						3.0
04	300	6.4					2.6	3.0
06	290	6.0					3.0	3.0
06	250	6.8			---	---	3.4	3.2
07	290	8.9	250	5.0	110	2.8	4.2	3.2
08	300	9.6	240	6.0	110	3.2	4.7	3.1
09	300	10.4	250	5.0	110	3.5	6.0	3.1
10	310	11.5	250	5.8	110	3.6	5.2	3.0
11	310	12.3	250	5.7	105	3.7	5.1	3.0
12	300	12.5	250	5.5	110	3.9	4.9	3.0
13	300	12.3	240	6.5	110	3.8	4.6	2.9
14	300	12.8	250	5.6	110	3.7	5.0	3.0
15	300	12.9	250	6.6	110	3.6	4.7	3.0
16	300	12.7	250	6.2	110	3.4	4.6	3.1
17	300	12.0	250	5.1	110	3.0	4.3	3.1
18	280	10.5	---	---	---	---	4.5	3.0
19	280	9.6					5.0	2.9
20	300	9.2					4.9	2.9
21	300	8.5					4.4	2.9
22	290	8.4					3.8	2.9
23	280	8.0					3.7	2.9

Time: 167.5°W.
Sweep: 2.0 Mc to 16.0 Mc, manual operation.

Table 33

Delhi, India (28.6°N, 77.1°E) October 1950

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2**
00	300	3.7						3.1
01	310	3.4						
02	---	---						
03	---	---						
04	310	3.8						3.5
06	300	3.7						
06	260	5.0						
07	250	8.2						
08	250	9.8						3.5
09	270	10.1						
10	280	10.8						
11	280	10.9						
12	300	12.0						3.3
13	300	12.6						
14	290	13.1						
15	280	13.0						
16	280	12.6						3.6
17	260	11.8						
18	260	10.1						
19	250	7.9						
20	260	5.8						3.0
21	280	4.6						
22	300	4.2						
23	320	3.6						

Time: Local.
Sweep: 1.8 Mc to 16.0 Mc in 6 minutes, manual operation.
*Height at 0.83 foF2.
**Average values; other columns, median values.

Table 34

Bombay, India (19.0°N, 73.0°E) October 1950

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2**
00								
01								
02								
03								
04								
06								
06								
07	300	8.9						
08	360	10.3						2.8
09	390	10.6						
10	420	11.8						
11	420	12.8						
12	450	12.9						2.6
13	480	13.2						
14	480	13.7						
15	480	13.9						
16	480	14.2						2.6
17	480	14.4						
18	480	14.2						
19	420	13.3						
20	420	12.7						2.6
21	390	11.3						
22	390	10.6						2.8
23	380	10.0						

Time: Local.
Sweep: 1.8 Mc to 16.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.
**Average values; other columns, median values.

Table 35

Madras, India (13.0°N, 80.2°E) October 1950

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2**
00								
01								
02								
03								
04								
06								
06								
07	360	8.4						
08	360	9.5						2.8
09	390	10.4						
10	420	10.6						
11	420	10.4						
12	450	10.6						2.5
13	450	10.8						
14	450	11.7						
15	450	12.0						
16	450	12.6						2.6
17	440	12.7						
18	420	12.6						
19	420	12.2						
20	420	11.5						2.8
21	---	(10.8)						
22	---	(10.4)						
23	---	---						

Time: Local.
Sweep: 1.8 Mc to 16.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.
**Average values; other columns, median values.

Table 36

Tiruchy, India (10.8°N, 78.8°E) October 1950

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2**
00								
01								
02								
03								
04								
06								
06								
07	360	8.3						
08	420	9.9						2.7
09	450	10.0						
10	480	9.9						
11	480	10.0						
12	480	9.5						2.3
13	480	9.7						
14	510	10.4						
16	(510)	(11.0)						
16	610	11.0						2.3
17	510	11.2						
18	480	10.7						
19	480	10.2						
20	450	9.8						2.6
21	420	9.8						
22	420	9.8						2.6
23								

Time: Local.
Sweep: 1.8 Mc to 16.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.
**Average values; other columns, median values.

Table 37

Brisbane, Australia (27.5°S, 153.0°E) October 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	6.0					1.9	3.0
01	240	5.5					2.5	3.0
02	250	4.8					2.0	2.8
03	260	4.4						2.8
04	265	4.4						2.8
05	275	4.2			150	1.3		3.0
06	245	5.8	250	---	120	2.3		3.2
07	270	7.0	240	4.3	100	2.7	3.4	3.2
08	270	7.5	220	4.5	100	3.1		3.1
09	280	7.6	210	4.7	100	3.4		3.1
10	295	8.5	200	4.9	100	3.4	3.7	3.0
11	300	8.3	200	4.8	100	3.6		3.0
12	300	8.5	200	4.7	100	3.5	3.2	3.0
13	290	8.6	200	4.8	100	3.6		3.0
14	300	8.4	205	4.7	100	3.4		3.0
15	290	8.3	220	4.5	100	3.2		3.0
16	270	8.1	230	4.1	100	2.8		3.1
17	250	8.0	---	---	110	2.3		3.1
18	240	8.0						3.0
19	250	7.0						2.8
20	280	6.8						2.8
21	285	6.8						2.8
22	290	6.5						2.8
23	260	6.5					2.0	2.9

Time: 150.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 38

Canberra, Australia (35.3°S, 149.0°E) October 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	5.0					2.3	2.9
01	250	4.7					2.5	3.0
02	250	4.2					2.5	3.0
03	250	3.7					2.4	2.9
04	270	3.6					2.5	2.8
05	280	3.4			---	E	2.5	2.9
06	245	4.6	---	---	110	1.8	2.7	3.1
07	250	5.5	230	---	110	2.5	3.4	3.1
08	290	6.2	220	4.4	100	3.0		3.2
09	300	6.4	210	4.5	100	3.2		3.1
10	315	6.5	200	4.5	100	3.3		3.0
11	330	7.0	200	4.5	100	3.4		3.0
12	305	7.4	200	4.5	100	3.5	3.5	3.1
13	300	7.4	200	4.5	100	3.4	3.4	3.0
14	300	7.4	200	4.5	100	3.4	3.5	3.0
15	290	6.8	210	4.5	100	3.2	3.5	3.1
16	280	7.0	220	---	110	3.0	3.4	3.1
17	240	7.1	230	---	110	2.4	2.5	3.1
18	240	7.2			---	<1.5	3.0	3.1
19	240	6.7						2.9
20	250	6.2					2.2	2.9
21	260	6.0					2.3	2.8
22	265	5.8					2.5	2.8
23	260	(5.5)						2.8

Time: 150.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 39

Hobart, Tasmania (42.8°S, 147.4°E) October 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	3.9						3.0
01	250	3.7						3.0
02	250	3.0						3.0
03	250	2.5						3.0
04	250	2.5						2.9
05	260	3.0			---	E		3.0
06	240	4.0	---	---	100	2.0		3.3
07	235	4.9	220	4.0	100	2.5		3.2
08	265	5.5	210	4.2	100	2.8		3.2
09	300	6.2	200	4.5	100	3.0		3.2
10	300	6.8	200	4.5	100	3.2		3.2
11	300	7.0	200	4.6	100	3.3		3.2
12	310	7.0	200	4.5	100	3.3		3.1
13	300	7.2	200	4.6	100	3.3		3.1
14	300	7.5	200	4.5	100	3.2		3.1
15	275	7.2	200	4.4	100	3.0		3.2
16	260	7.2	200	4.0	95	2.9		3.2
17	240	6.8	215	3.5	100	2.4		3.2
18	240	6.8	---	---	110	1.8		3.2
19	220	6.8			---	E		3.1
20	230	6.0						3.0
21	240	5.3						3.0
22	250	4.7						2.9
23	250	4.1						2.9

Time: 150.0°E.
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.

Table 40

Dakar, French West Africa (14.6°N, 17.4°W) August 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	350	5.2						
01	330	5.1					2.3	
02	300	4.6					2.2	
03	265	4.4					2.4	
04	270	4.5					2.5	
05	265	4.0					2.2	
06	250	5.9			155	2.0	2.7	
07	245	6.8	230	---	125	2.8	2.8	
08	255	7.4	230	---	120	---	3.9	
09	310	8.0	215	---	118	---		
10	355	9.2	---	5.4	115	---		
11	350	10.4	---	5.3	120	---		
12	385	11.4	---	5.3	110	---		
13	395	12.4	---	5.2	---	---		
14	355	13.1	---	5.1	---	---		
15	330	(>14.0)	235	---	120	---		
16	320	14.0	230	---	120	3.2		
17	290	13.9	245	---	---	---	3.4	
18	260	12.8	---	---	---	---	2.9	
19	260	10.7					2.9	
20	310	8.4						
21	352	6.8						
22	(360)	5.8						
23	350	5.4						

Time: Local.
Sweep: 1.4 Mc to 20.0 Mc in 10 minutes, automatic operation.

Table 41

Poitiers, France (46.6°N, 0.3°E) July 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	310	(6.1)						---
01	320	(5.9)						(2.8)
02	320	5.9						(2.8)
03	310	5.5						---
04	320	5.2						(2.8)
05	280	5.4	---	---				(2.8)
06	300	6.1	250	3.9			3.8	3.1
07	300	6.6	230	4.3			4.8	(3.0)
08	330	6.6	225	4.6			5.2	(3.0)
09	330	7.1	230	4.7			5.5	3.0
10	300	7.3	215	4.8			5.0	3.0
11	335	7.0	210	4.9			5.0	3.0
12	330	7.0	220	4.9			5.1	3.0
13	350	7.3	210	5.0			5.0	2.9
14	335	7.1	220	4.9			4.8	2.9
15	330	7.1	230	4.8			4.4	3.0
16	320	7.0	220	4.5			4.0	3.0
17	310	7.3	230	4.4			4.4	3.0
18	290	7.6	250	---			4.1	3.0
19	270	8.0	270	---			3.8	3.0
20	260	8.0					3.3	(3.0)
21	275	7.4						(3.0)
22	280	7.0						(3.0)
23	300	6.4					3.6	(2.8)

Time: 0.0°.
Sweep: 3.1 Mc to [illegible] Mc in [illegible] seconds.

Table 42

Poitiers, France (46.6°N, 0.3°E) June 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	310	6.9						2.6
01	320	6.6						2.7
02	305	6.4						2.7
03	320	6.0						2.7
04	300	5.9						2.8
05	280	6.3	270	---				2.8
06	300	6.9	230	(4.0)			3.4	2.9
07	300	7.2	220	---			4.8	2.9
08	300	7.6	220	4.6			4.9	3.0
09	320	7.5	225	4.8			5.0	2.9
10	330	7.5	220	4.9			5.1	2.9
11	350	7.5	210	(5.0)			5.0	2.8
12	350	7.6	225	5.0			5.0	2.8
13	350	7.5	225	4.9			4.3	2.8
14	350	7.4	225	5.0			5.0	2.8
15	330	7.5	225	5.0			5.1	2.9
16	320	7.6	230	4.7			5.0	2.9
17	320	7.6	240	---			4.8	2.8
18	300	8.3	250	---			4.8	2.9
19	285	8.5	270	---			4.8	2.9
20	260	8.2					4.6	2.9
21	270	8.2					4.1	2.8
22	280	7.6						2.7
23	280	7.5						2.7

Time: 0.0°.
Sweep: [illegible] to 11.0 Mc in 1 minute 15 seconds.

TABLE 43

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

Form adopted June 1946

h'F2 (Characteristic), Km (Unit), April (Month), 1951

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: McC., A.C.K.

Calculated by: McC., A.C.K.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	280	290	280	270	270	290	250	250	250	250	280	280	310	300	300	280	260	260	240	220	230	270	260	290
2	280	280	270	270	270	260	260	250	260	270	310	370 K	320 K	340 K	320 K	300 K	310 K	340 K	270 K	250 K	240 K	260 K	280 K	300 K
3	290 K	240 K	(420) S K	(370) S K	(340) B K	(310) S K	290 K	260 K	370 K	470 K	410 K	350 K	340 K	350 K	310 K	300 K	340 K	310 K	270 K	240 K	220 K	260 K	(300) S K	310 K
4	(330) S K	(330) S K	[330] S K	330 K	B K	B K	280 K	240 K	340 K	370	510	370	380	350	360	340	310	290	280	280	270	260 F	270 F	320 F
5	330	(320) S	330	320	(370) S	[340] B	280	[360] L	470	420 H	460 H	410	340	320	340	330 K	320 K	390 K	260 K	230 K	220 K	230 S K	(250) S K	S K
6	S K	(350) S K	340 K	(350) S K	S K	S K	260 K	G K	G K	440 K	420	380	380	350	330	330	300	280	260	240	240	260	300	320
7	300	290	290	290	S	S	300	310 K	G K	470 K	G K	[510] N K	410 K	400 K	370 K	350 K	330 K	280 K	250 K	240 K	220 K	(300) S K	[310] S K	(320) S K
8	300 K	(350) A K	(300) A K	[320] S K	(340) S K	(350) S K	270	[340] L	400	380	350	410 H	370	370	330	320	300	300	260	230	240	280	290	300
9	300	(300) S	310	320	310	(330) S	280	260	300	(320) L	360	330	330	340	310	300	300	280	260	240	240	280	310	[310] A
10	310	310	280	270	250	300 S	250	300	290	300	350	320	300	300	310	300	300	270	250	240	240	250	(270) S	(280) S
11	310 S	300	280	270	260 S	(270) S	260	L	L K	500 K	440 K	470 K	460 K	420 K	370 K	350 K	370 K	320 K	280 K	260 K	250	270 S	280 S	270 S
12	270	260	270	270 S	[280] B	290 S	270	240	320	320	340	330	400	320	320	310	310	300 K	270 K	300 K	260 K	250 K	250 K	270 K
13	290 K	(260) A K	240 K	260 K	220 K	300 K	220 K	420 K	L K	G K	500 K	650 K	460 K	370 K	400 K	350 K	320 K	310 K	280 K	250	230	250	270	310
14	320	300	300	280	320	(300) A	250	260	290	(310) L	330	310	320	320	320	300	280	260	240	230	220	230	260	280
15	290	280	280	270	250	280	260	250	270	280	260	300	320	300	300	290	280	250	250	230	220	230	240	280
16	290	290	280	270	260	250	240	250	250	270	280	300	320	310	300	290	280	270	280	230	230	230	260	270
17	270	280	270	250	280	290	270	280	280	290	300	350	340	330	330	310	300	280	260	230	(250) A	230 S	270	(280) S
18	(280) S	310	(300) A	300	300	280	260 K	[400] L K	530 K	G K	G K	G K	G K	650 K	560 K	500 K	450 K	370 K	310 K	270 K	240	280	270	260
19	300	(320) S	(330) S	300	[300] A	(300) A	240	300	340	340	370	[360] B	350	350	340	380	290	280	270	240	260	270	270	280
20	290	300	270	300	300	300	320	370	370 K	700 K	640 K	530 K	540 K	570 K	500 K	440 K	460 K	370 K	280 K	260 K	230 K	270 K	270 K	280 K
21	250 K	350 K	330 K	330 K	320 K	280 K	270 K	260 K	300 K	360 K	480 K	450 K	460 K	500 K	460 K	440 K	420 K	350 K	330 K	280 K	250 K	(260) S K	(300) S K	310 K
22	330 K	300 K	290 K	300 K	330 K	350 K	310 K	480 K	G K	G K	670 K	580 K	480 K	500 K	500 K	420 K	380	330	270	260	250	240	270	310
23	300	310	270	240	260	300	280	330	410	430	470 H	470	440	430	400	360	370	320	300	250	230	250	280 S	290
24	290	320	290	270	280	300	250	350	380 H	420 H	500 H	450	420	400	430	370	370	340	300	270	270	310	330	330
25	330	320	330	310	300	340	L	L K	440 K	570 K	G K	580 K	590 K	520 K	490 K	450 K	420 K	360 K	320 K	260 K	250	300	(290) A	280
26	260	300	300	300	300	300	(280) A	330	300	290	300	320	370	330	300	300	290	270	250	240	240	240	260	270
27	280	300	300	280	300	310	[340] L	360	[380] L	390	450	420 H	390	400	310	330	360	280	280	260	250	270	(250) S	(280) S
28	270	290	260	260	250	260	260	300	390	360	470	430	490	380	390	340	320	290	270	230	[230] A	230	(300) S	(300) S
29	310	280	280	270	280	300	220	270 H	280	290	310	330	380	370	300	300	300	280	A	A	A	(250) A	280	(300) A
30	A	A	(330) A	290	(280) A	[260] A	250	280	220	270	370	310	330	320	310	300	300	280	260	[240] C	(250) A	(280) A	(290) A	(280) S
31																								
Median	300	300	290	280	280	300	270	300	340	360	420	380	380	350	330	330	310	290	270	240	240	260	270	290
Count	28	29	30	30	27	27	29	28	28	30	30	30	30	30	30	30	30	30	29	29	29	30	30	29

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 44

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

Form adopted June 1946

foF2 (Characteristic), Mc (Unit), April (Month), 1951

Observed at Washington, D. C.

Lat. 38.7°N, Long. 77.1°W

National Bureau of Standards (Institution)

Scaled by: McC., A. C. K.

Calculated by: McC., A. C. K.

75°W Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	4.6F	4.5F	4.2	4.0JS	(3.4)JF	(3.0)JF	4.8	6.4	6.7	6.7	7.4	7.2	7.5	8.0	8.4	8.5	8.4	8.3	8.2	7.4	6.6	6.2	5.9	5.6		
2	5.4	5.2	5.1	4.8	4.2	3.8	4.4	6.2	6.7V	7.6V	7.8	8.0K	9.3K	9.2K	8.6K	7.4HK	6.4K	5.6K	6.3K	5.4K	5.3K	3.7K	3.7K	3.3SK		
3	3.5SK	K3.0JS	K(2.4)JS	K2.2JS	2.4K	2.3K	2.9K	3.8K	4.2K	K4.4FH	5.0HK	K6.0FS	6.6K	7.1K	8.0HK	7.6K	6.8HK	6.6SK	6.8K	6.8K	5.8K	3.6K	K3.4JS	K(3.1)HS		
4	3.1K	K(2.5)JS	(2.3)SK	K(2.5)SF	2.1FK	2.1FK	3.1FK	4.2K	4.5K	5.2	5.0	5.6JH	6.0	6.3	6.2	5.8	5.8	5.7	6.0	6.2	5.5	4.6F	4.3F	3.6F		
5	3.1F	(2.7)SJ	2.7F	3.0JF	2.7F	(2.6)BS	3.1	3.8	4.2	4.7	4.9H	5.3F	5.8	6.0F	5.8	6.4K	6.0K	7.0K	K7.8JS	7.6PK	K6.4JS	K4.6PS	K3.7JS	3.0K		
6	K2.9JS	K2.7JS	K(2.8)JF	K2.5FP	K(2.2)FS	[2.2]SK	2.9K	<3.6GK	<3.8GK	4.5K	4.9	5.2F	5.6F	6.4	6.8JH	7.4	(7.2)S	7.2S	6.4	(6.4)S	(5.6)S	(4.0)SF	3.9S	3.8		
7	3.5F	3.7S	3.3F	2.7F	(2.0)JS	[2.1]BS	3.0	4.0K	<3.9GK	4.3K	K<4.1GB	[4.6]NK	5.0FK	5.5K	6.0K	6.2K	6.4K	6.4K	5.6JK	5.4SK	4.3K	3.2K	3.0K	3.0K		
8	K2.8JF	K2.6JF	2.6FK	K2.0JF	K1.8JB	1.8K	3.3	4.1	4.5	4.9	5.1H	5.0	5.5	6.0	6.4	6.4	6.0	5.9	6.0S	5.4	4.8S	4.0JS	3.7S	3.4S		
9	3.2F	3.0FS	2.5SF	2.3F	2.2V	2.3F	3.5	4.7	5.0	5.2	5.6	6.2	6.4	6.8	7.4	7.2	6.2	6.0S	5.5	5.4	5.1S	4.1	(3.5)S	3.6		
10	3.6	3.6V	3.5	3.1JS	2.9	(2.4)SP	3.9	5.2	6.2	6.5	6.6H	6.8	7.3	7.3	7.0	6.9	7.0	7.3	7.1	6.7	6.0S	5.1PS	4.3	3.9S		
11	4.0S	3.9	4.0	3.7	3.3	2.9S	3.8	4.3	4.7K	4.6HK	5.1K	5.2K	(5.2)JK	5.2K	5.2K	5.3PK	5.2K	5.6K	5.6K	5.8K	5.6	5.2	5.0	4.7P		
12	4.8	4.2P	3.8P	3.1P	2.8P	2.7	3.8	4.8JH	5.3	5.7	5.9	6.1	6.2	7.2	6.9	6.7	6.7	6.6K	7.1K	7.3K	7.6K	7.0K	6.8SK	6.9VK		
13	6.5K	6.3VK	5.0VK	4.0K	3.6K	3.1K	4.1K	4.6K	4.8K	<4.2GK	5.0K	4.9K	5.8HK	6.3HK	6.2HK	6.6K	6.4K	6.5K	6.6K	6.8	6.0	4.3	3.9S	3.5		
14	3.5	3.4F	3.4F	3.2	2.9F	3.0F	4.5	5.7V	6.2V	6.1	6.8	7.6	7.4	7.7	8.0	8.2	8.2	8.2	8.3	8.2	7.0	6.1	5.3	5.0V		
15	4.9F	4.6F	4.3F	4.2	3.7F	3.4F	5.0F	6.6	7.4	7.6	7.4	7.6	8.0	8.1	8.8	9.0	8.6	8.4	8.8	8.4S	7.5S	6.2F	5.0F	(4.6)SF		
16	4.7SF	4.5F	4.4SF	4.4SF	4.2	4.1	5.6S	7.2	7.6	7.6	7.3	7.6	8.0	8.5	8.6	8.5	8.1	8.0	8.8	9.0	8.2S	6.6	5.8	5.9		
17	5.6	5.4	5.1	4.6	4.2	3.8	5.0	6.0	6.0	6.4	6.6H	6.8	7.0	7.4	7.8	7.8	7.6	7.6	8.0	7.7JS	6.9	5.8	5.0	4.8		
18	4.6F	4.1	(4.0)FS	3.2F	3.2F	3.0F	4.6FK	4.6FK	4.4FK	<4.2GK	<4.3GK	<4.3GK	<4.3GK	5.1FK	5.0FK	5.2FK	5.4K	6.0K	5.7PK	5.6SK	5.0FS	4.2PS	3.7FS	3.2FS		
19	3.0PF	2.8FP	2.7F	2.4F	2.4P	2.6F	4.2	5.2	5.8V	6.0H	6.4V	(6.6)B	7.2	7.5	7.6	7.6	7.7	7.4	7.6	7.8S	7.0S	6.6F	5.9F	5.1F		
20	4.9F	4.5F	4.4S	3.8	3.6	3.5	4.3	5.0	5.0K	4.7K	4.9K	5.1K	5.3K	5.4K	5.7K	6.0K	5.9K	(6.2)HK	8.8K	8.4K	6.0K	4.7SK	4.5K	K4.3FH		
21	K4.1FV	3.7VK	3.8HK	K3.0JS	K(2.9)SH	2.9FK	5.0K	6.2HK	6.0K	5.9HK	5.3K	5.5HK	5.4K	5.3K	5.3K	5.5K	5.6K	5.8K	5.9K	(6.1)SK	6.0K	4.3SK	3.8K	3.7SK		
22	K3.6JS	K3.6FS	2.8FK	2.4FK	K2.4FH	2.4K	3.8K	4.2K	<4.1GK	<4.1GK	4.7PK	5.1K	5.6K	5.4K	5.6K	6.4K	6.6H	7.0F	7.1	7.1F	6.9	5.6	5.0	4.9		
23	4.5FJ	4.6	4.2F	4.0F	3.3F	3.1F	4.4	5.1H	5.2H	5.4H	5.3	5.5	5.8	6.0	6.1	6.2	6.4	6.4	6.8	6.8	6.6	5.7	5.2	5.0		
24	4.7F	4.7F	4.8F	4.7	3.6F	3.7F	4.4F	5.0F	5.5	5.6	5.4	6.0	6.4	6.7	6.4	6.4	6.0	5.7	5.9	5.7	5.7	5.2	5.1	5.0		
25	4.8	4.6FH	(3.5)F	3.1F	2.8F	2.8F	4.0	4.6K	4.7K	4.7K	<4.4GK	5.3K	5.2K	5.5K	5.7K	5.6K	5.7HK	5.8HK	5.6K	5.4K	5.9	5.3	5.0	5.2VF		
26	4.4VF	4.5V	4.2V	3.5F	3.2F	3.4F	4.6F	5.8H	(7.4)H	7.4	7.8	7.4	7.5	8.2	8.6	8.4	8.0	7.9	7.6	7.8	7.4	6.4	5.8F	5.3F		
27	4.7F	4.4F	4.0F	3.8	3.3F	3.2	4.0S	4.9H	5.3H	5.8	5.6	6.2	6.6	7.0	7.8	7.2	7.0	7.4	6.4	6.8	6.4	5.8S	5.2	4.9		
28	4.1	3.8	3.7	3.5	3.0	3.5	5.3	6.0	(6.6)H	5.6JH	5.4H	5.6VH	5.6	6.0	6.2	6.5	6.8	7.2	7.4	8.0	6.6	5.4	4.7	4.5		
29	4.2	4.2	3.8	3.6	3.1	3.2	4.8	6.2H	6.6H	6.5H	(6.6)H	7.0	6.8	7.5	8.3	7.5	7.2	7.6	7.6	7.5	6.4	5.3	4.9	4.5		
30	4.3	4.1F	4.0	3.8	3.7	3.8H	5.6H	6.8	6.5H	6.6H	6.8	7.2	7.4	7.5	7.8	7.8	7.6	7.7	7.5	[7.9]C	7.2	6.5	6.1	5.6		
31																										
Median	4.2	4.1	3.8	3.4	3.0	3.0	4.2	5.0	5.3	5.6	5.4	6.0	6.3	6.8	6.8	6.8	6.6	6.8	7.0	6.8	6.2	5.2	5.0	4.6		
Count	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 45

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

Form adopted June 1946

IONOSPHERIC DATA

foF2 (Characteristic), Mc (Unit), April (Month), 1951

Observed at Washington, D. C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: McC., A. C. K.

Calculated by: A. C. K.

Day	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330
1	4.5	4.3	4.1 JS	(3.8) JS	3.2 F	3.2 SF	5.6 JS	6.7	6.9	7.2	7.4	7.4	7.7	8.1	8.4	8.5	8.5	8.3	8.2	6.8	6.3	6.0	5.7	5.5
2	5.2	5.2	5.0	4.6	4.1 V	3.8	5.3	6.4	6.9	7.0 J	7.7	9.0 K	9.0 K	8.8 K	8.0 HK	6.7 HK	6.0 K	6.2 K	5.8 K	5.4 K	4.5 K	3.9 K	3.6 K	3.4 K
3	3.2 K	K2.7 JS	K(2.4) JS	2.4 K	2.5 K	K2.4 SB	3.5 K	(4.3) SK	4.4 K	5.0 K	K5.4 SF	6.8 SK	6.8 K	7.8 HK	7.8 HK	7.0 SK	(7.0) SK	7.2 K	6.8 K	5.6 K	K4.5 SF	K3.3 JS	K3.0 FS	K3.1 JH
4	K(2.9) JF	K(2.3) SF	K[2.3] JS	2.3 FK	2.1 FK	K(2.2) BS	3.8 K	4.3 K	4.9 K	5.4 H	5.2	5.6 F	6.0 F	6.0 S	6.0	6.0	5.8	5.6	6.3	6.1	5.0	4.4 F	3.8 F	3.2 F
5	(2.8) JF	(3.0) JF	(3.2) JF	(2.6) F	2.6 F	(2.3) BS	3.6	4.1	4.3	5.0 H	5.2	5.7	6.0	5.8	6.0	6.2 K	K6.6 JS	K(7.0) JS	K7.8 JS	7.0 PK	K5.4 PS	K4.1 PS	3.5 PK	K3.0 JS
6	[2.8] SK	K(2.8) JS	2.7 FK	K2.5 PF	[2.4] SK	K2.2 P	3.5 PK	<3.7 GK	(4.3) SK	(4.5) SK	5.0 F	5.6	5.8	6.8	6.8	7.6	(7.2) S	6.6	6.6	6.0 S	(5.3) S	(4.0) S	4.0 JS	(4.0) S
7	3.8 S	3.4 F	(2.9) JF	2.4 JS	1.9 JS	2.2 S	3.6	<3.9 GK	<3.9 GK	K(<4.2) BG	[4.4] SK	4.7 K	5.4 K	5.5 K	6.4 K	6.6 K	6.6 HK	6.0 K	5.4 SK	5.2 K	3.4 SK	3.2 K	2.9 K	2.8 FK
8	K2.8 JA	2.5 FK	K2.3 JS	K1.8 JS	1.8 JK	K2.4 JS	3.7	4.2	4.7	5.0	5.2	5.4	5.6	6.2	6.4	6.2	5.8	6.0 S	5.8	5.2	4.3	3.7 S	3.4	3.4 JS
9	3.2 F	2.9 S	2.6 JS	2.3 V	2.4 S	2.5 SB	4.0 JS	4.7	4.0	5.6	5.8	6.2	6.6	7.0 H	7.4	6.8	6.0	5.6	5.6 S	5.4	(4.9) JF	2.9 S	(3.5) S	3.6
10	3.6	(3.5) PS	(3.4) SF	(2.8) JS	2.4	3.0	4.6	5.8	6.4 H	6.6	6.8	6.8	7.4	6.9	7.0	6.8	7.2	7.1 S	7.0	6.4 S	5.5	4.9 S	4.0	3.8
11	4.0 S	4.0 S	3.8	3.6 S	(3.0) SJ	(3.2) SJ	4.2	4.6	[4.7] CK	5.0 K	5.0 SK	5.3 K	5.4 K	5.2 K	5.3 K	5.2 PK	5.6 K	5.4 K	5.6 K	5.8 PK	5.5	5.0	5.0	4.8
12	4.5 P	3.9	3.3	2.9	2.5 P	3.1 J	4.3	5.0	5.5	5.8	5.9 J	6.1 P	6.7	7.1	6.8	[6.7] B	6.7	7.0 K	7.2 K	7.5 K	7.3 SK	7.0 SK	7.0 VK	6.6 VK
13	6.5 K	5.9 K	4.2 K	3.8 K	3.2 K	3.3 K	4.5 K	5.2 K	4.7 HK	5.0 K	5.3 K	5.5 K	6.2 HK	5.9 K	6.2 K	6.5 HK	6.6 K	6.6 K	6.6 K	6.6	5.2 S	4.1	3.5	3.5
14	3.5	3.4 F	3.2	3.0 F	2.9 F	3.7	5.2	5.8	6.2	6.2	7.3	7.4	7.6	8.0	8.2	8.0	8.2	8.2	8.4	7.4	6.7	5.6	5.1	4.8 F
15	4.5 F	4.6 F	4.2 F	4.1 F	3.5 F	3.8 F	6.0 S	7.0 F	7.4	8.0	7.3	7.8	8.1	8.6	8.8	8.8	8.6	8.5	8.6	8.2	6.8 F	5.6	5.0	4.7
16	4.5 F	4.5 FS	4.4 F	4.3 JF	4.2	4.5 F	6.6	7.7	7.5	7.4	7.2	7.8	8.4	8.5	8.5	8.3	8.0	8.1	9.1	8.5	7.5	6.0 V	5.9	5.8
17	5.5	5.2	5.0	4.3	4.0	4.2	5.6	6.2 H	6.4	6.4 H	7.6	6.8	7.4	7.6	7.8	7.7	7.6	7.6	8.2 S	7.4 JS	6.5	5.4 S	5.0	4.7
18	4.3	(4.0) FS	3.3 F	3.1 F	3.0 F	3.6 FS	4.8 FK	4.3 FK	<4.2 GK	<4.3 GK	<4.3 GK	<4.3 GK	(4.7) FK	5.0 K	5.2 FK	5.3 K	(5.6) BK	5.9 K	5.7 K	5.5 SK	4.7 S	4.1 JS	3.6 SF	3.0 F
19	2.8 FS	2.7 FS	(2.6) PF	2.4 P	2.3	3.5	4.6 FV	5.4 Y	6.0 H	6.2	6.8	7.0	7.2	7.6	7.5	7.8	7.4	7.4	7.7	(7.1) S	6.5 F	6.3 F	5.4 F	5.1 F
20	4.7 F	4.5 F	4.1 JS	3.7	3.5	3.6	4.6	5.1	4.6 K	4.8 K	5.1 K	<4.5 GK	5.4 K	5.6 K	5.7 K	5.5 K	6.6 HK	9.0 K	8.4 K	7.8 K	5.2 SK	4.8 K	4.1 K	4.5 VK
21	3.4 HK	3.6 VK	3.8 HK	K(2.9) JF	2.6 SK	4.1 FK	5.6 FK	6.3 HK	6.2 HK	5.2 HK	5.2 K	5.5 K	5.4 K	5.4 HK	5.4 K	5.6 K	5.8 K	5.6 K	6.2 K	6.2 SK	5.0 K	(4.1) SK	K3.9 JS	3.6 SK
22	K3.2 JF	K3.2 FJ	2.5 FK	K(2.1) BF	(2.3) FK	3.1 K	<3.9 GK	4.3 K	<4.1 GK	4.6 K	5.0 K	5.4 K	5.4 K	5.4 K	5.9 K	6.3 K	6.8 FH	7.4 V	6.8 F	7.2	6.6	5.1	4.9	4.8
23	4.2	4.4 JF	4.8 F	3.7 F	2.9 F	3.6 F	4.8	5.2 H	5.3	5.4	5.5	5.6	5.9	6.1	6.2	6.2	6.4	6.2	6.8	6.8	6.2 S	5.4	5.0	4.8
24	4.6 F	4.6 SF	5.0 F	4.6 F	3.5 F	4.4 F	4.9	4.9 H	5.4	5.4	5.8	6.4	6.4	6.4	6.7	6.2	6.0	5.6	5.8	5.9	5.3	5.0	5.0	4.9
25	4.8 F	4.2 FJ	3.1 F	3.0 F	2.3 F	3.3 F	4.4 H	4.5 K	5.0 K	4.9 K	5.0 K	<4.5 GK	5.4 K	5.7 K	5.5 K	5.7 HK	5.5 K	5.6 K	5.6 K	5.7 K	5.4	5.2	5.0	4.8 F
26	4.4 F	4.5 F	3.9	3.3 F	3.3 F	4.0	5.1	6.7 H	7.6	7.4 H	7.5	7.2	7.8	8.8	8.5	8.1	8.0	7.6	7.6	7.7	7.0	6.1 F	5.3 F	5.1
27	4.5 F	4.2 F	3.9	3.6 F	3.2	3.7 H	4.4	5.2 JH	5.4 H	5.7 H	6.2	6.5	6.6	8.2	7.4	6.8	7.4	6.8	6.6	6.6 S	6.0 S	5.6	4.9	4.5
28	3.8	3.8	3.6	3.4	2.9	(4.3) S	6.2 V	5.8 H	6.0	(5.4) H	5.8	5.6 H	5.8	6.2	6.4	6.4	7.0 S	7.1	7.8	7.8	5.8	5.2	4.5	4.2
29	4.2	4.0	3.7	3.3	3.0	4.3	5.7	6.6	6.7	6.4	6.8	6.7	7.2	8.3	7.9	7.4	7.6	7.8	7.6	7.2	5.6	5.0	4.7	4.4
30	(4.2) S	4.0 F	3.8	4.0 F	3.7 H	(4.5) A	(6.0) AH	6.9	7.0	7.0	7.2 H	7.5	7.6	7.6	7.8	7.7	7.6	7.6	8.0	7.9	6.8	6.3	5.8	5.6
31																								
Median	4.2	4.0	3.6	3.2	2.9	3.6	4.6	5.2	5.4	5.4	5.8	6.2	6.5	6.8	6.8	6.7	6.8	7.0	6.8	6.7	5.5	5.0	4.8	4.5
Count	30	30	30	30	30	30	30	30	30	30	30	30	30	30	34	30	30	30	30	30	30	30	30	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 46

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

h'F1 (Characteristic), Km (Unit), April (Month), 1951

Observed at Washington, D. C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: McC., A.C.K.

Calculated by: McC., A.C.K.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								240	220	220	190	190^H	190	190	200	230	220	230	Q					
2								230	230	210	200^H	210K^H	230^K	240^K	230^K	240^K	240^K	250^K	Q^K					
3								Q^K	230^K	220K^H	210K^H	200^K	200K^H	240^K	240^K	230^K	230^K	260^K	250^K					
4								Q^K	220^K	220^H	210	190	200	180^H	220^H	230	240^H	240	270					
5								240	230	210	190	180^H	190^H	220	200^H	230^K	200K^H	250^K	250^K					
6								240^K	230^K	210^K	200	200	200^H	210^H	220	230	220	220	Q					
7								230^K	220^K	200^K	200^K	190K^H	190K^H	200^K	220K^H	200K^H	220K^H	240^K	Q^K					
8								250	220	200	210^H	190^H	200	190	180^H	210	220	240	Q					
9								250	220	210	190	190^H	210	210	220^B	220	220	250^H	240					
10								220	220	220	220	210	200	220^H	230	220	240	250	250					
11							240	240	220K^H	200^K	190K^H	180K^H	190K^H	220K^H	240K^H	220^K	220K^H	230^K	260^K					
12							Q	Q	220^H	220	220	210	210	200^H	230	230^H	[240]^B	250^K	250^K					
13							Q^K	240K^H	210K^H	210^K	200K^H	240K^H	230K^H	240^K	250^K	240^K	240^K	230^K	A^K					
14							A	230	220	200	190	200^H	220	200^H	230	230	230	230	Q					
15							Q	230	220	200^H	190	190	210^H	210^H	220^H	230	230	230	Q					
16							Q	220	210	200	190	200	190	210	220	220	230	240	260					
17							260	230^H	230	220	210	200	200^H	230	240	230	230	250	250					
18							250^K	250^K	250^K	210^K	210^K	190^K	240^K	A^K	A^K	240^K	[260]K^B	280^K	270^K					
19							Q	220	200	200^H	A	B	(230)^B	230	220	220	230	240	250					
20							280	240	220^K	200^K	190K^H	200^K	200^K	250^K	250^K	240^K	240^K	250^K	B^K					
21							260^K	240^K	230^K	230^K	220^K	220^K	220K^H	230K^H	220^K	230^K	240^K	260^K	270^K					
22							210K^H	250^K	230^K	200^K	230^K	210^K	230^K	230^K	250^K	250^K	250^H	260	260					
23							240	230	240^H	210	220	220	230	210^H	240	220	250^H	260	270					
24							Q	250	220^H	230	200^H	200	230	240	260	240	230	240^H	270					
25•							260	260^K	240^K	210^K	200^K	200^K	210^K	220^K	250^K	240^K	250^K	240K^H	260^K					
26							A	240	230	220	200	210	210	210	230^H	220	220	230	240					
27							260	240	240	190^H	200^H	200	210	220	220	220	220	230	240					
28							Q	230	220	210	220	230^H	220^H	200	240^H	220	220	220	240					
29							240	230	210	190^H	190	190	220	210^H	220	200	220^H	230	Q					
30							240	[220]^A	210	[220]^A	220	200^H	[210]^A	(220)^A	230	220	220	220	250					
31																								
Median							250	240	220	210	200	200	210	220	230	230	230	240	250					
Count							11	27	30	30	29	29	30	29	29	30	30	30	20					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 47

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

foF1 (Characteristic), Mc (Unit), April (Month), 1951

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: McC., A.C.K.

Calculated by: McC., A.C.K.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L	L	43	47H	48	47	46	L	L	L	Q					
2								L	L	42	45H	50HK	47K	44K	43K	42K	41K	LK	QK					
3								QK	38K	40HK	43HK	43K	43HK	44K	43K	42K	42K	LK	LK					
4								QK	39K	42H	43	43	43	43H	43H	42	40H	L	L					
5								L	38	41	42	44H	45H	45	45H	43K	LHK	LK	LK					
6								36K	38A	40K	42	43	43H	45H	45	43	L	L	Q					
7								33K	39JK	40K	41K	43HK	43HK	44K	43HK	43HK	40HK	LK	QK					
8								L	40	41	43H	44H	44	43	43H	42	40	37	Q					
9								L	39	42	46	46H	45	45	44	43	41	LH	L					
10								L	L	45	46	46	47	47H	46	44	41	L	L					
11							L	L	LHK	42K	44HA	45HA	46HK	45HA	45HK	43K	42HK	LK	LK					
12							Q	Q	41H	44	46	47T	[47]S	47H	46	46H	B	LK	LK					
13							QK	36HK	K(42)LH	42K	44HA	44HA	45HK	47K	47K	46A	43K	38K	LK					
14							A	L	41	[44]L	49	49H	49	47H	49	47	L	L	Q					
15							Q	L	L	LH	45	50	53H	47H	45H	45	L	L	Q					
16							Q	L	39	42	45	47	51	50	47	46	42	L	L					
17							L	LH	41	44	48	53	48H	49	50	45	43	L	L					
18							LK	LK	40K	42K	43A	43A	43K	44K	44A	43K	[42]BK	41K	LK					
19							Q	L	43H	45H	[48]L	[50]B	52	49	48	47	43	L	L					
20							L	37	42K	44K	44HK	44A	46A	45K	45K	45A	42A	41A	QA					
21							LK	LK	42K	44K	45A	44K	45HA	47HK	46K	45A	43K	40A	LK					
22							LK	38K	41K	41K	43K	46K	46K	46K	45K	45K	44H	40	L					
23							L	40	43H	44	45	47	48	48H	48	46	45H	L	L					
24							Q	L	44H	45	47H	47	47	48	47	45	43	41H	L					
25							L	LK	42K	44K	44A	46K	45K	46K	45K	44A	43K	39HK	LK					
26							A	40	42	44	47	41	50	48	45H	L	L	L	L					
27							L	38	[42]L	45H	47H	48	49	49	47	47	45	L	L					
28							Q	L	44	45	45	47H	48	47	45H	45	44	L	L					
29							L	L	40H	43H	(45)H	48	49	50H	47	46	43H	L	Q					
30							L	L	L	44	[46]L	47H	49	46	46	46	42	L	L					
31																								
Median							–	38	41	44	45	46	47	47	45	45	42	40	–					
Count								8	24	28	30	30	30	30	30	28	23	8						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 48

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

h'E (Characteristic), Km (Unit), April (Month), 1951

Observed at Washington, D.C.

Lat. 38.7°N, Long. 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: McC., A.C.K.

Calculated by: McC., A.C.K.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								110	110	110	110B	110	B	B	110	110B	120	120	(140)B					
2								120	110	110	110	110K	100K	110K	110K	110K	110K	120K	130K					
3								120K	110K	110K	110K	110K	110K	100K	100K	110K	110K	110K	140K					
4								120K	110K	110	110	110	110	110	100	110	110	110	120					
5							120S	110	110	110	110	100	100	110	110	110K	110K	120K	130K					
6								120K	110K	110K	100	100	100	110	110	100	110	120	130					
7								120K	110K	100K	[100]BK	110K	110K	120K	110K	110K	(110)BK	120K	BK					
8							120	110	110	110	100	100	100	100	(110)B	110	110	120	120					
9								110	110	110	(120)B	(100)B	110	100	110	110	110	110	120					
10								110	100	[100]B	110	110	110	[110]B	110	110	110	120	130					
11							(130)B	110	110K	110K	110K	110K	100K	100K	100K	100K	110K	110K	120K					
12							120	110	100	110	[100]B	(100)B	100	110	110	110	[110]B	110K	120K					
13							110K	110K	110K	110K	110K	110K	110K	110K	110K	110K	100K	100K	AK					
14							A	110	110	110	110	110	100	110	110	110	110	110	120					
15							110	110	110	110	110	110	100	110	(100)A	110	110	110	120					
16							110	110	100	100	100	100	100	110	110	110	100	110	120					
17							130	110	120B	100	100B	100	110	110	110	110	110	(100)A	(100)A					
18							130K	130K	110K	110K	(100)HK	(100)AK	110K	(110)AK	(100)AK	100K	[100]BK	110K	(100)AK					
19							110	100	100	(100)A	100	B	B	(120)B	110	110	110	110	120					
20							120	110	110K	110K	110K	100K	110K	110K	110K	110K	110K	110K	[110]BK	120K				
21							120K	110K	100K	100K	110K	110K	110K	110K	110K	110K	100K	110K	120K					
22							110K	110K	110K	110K	110K	100K	110K	110K	110K	110K	110	110	120					
23							110	110	100	110	100	100	100	100	100	110	110	110	120					
24							130	110	110	110	110	110	120	110	(120)B	110	110	120	130					
25							110	110K	100K	100K	100K	110K	100K	110K	100K	110K	110K	120K	120K					
26							120	110	110	110	100	110	110	110	110	110	110	120	120					
27							110	120	110	110	110	110	110	110	110	110	110	110	120					
28							110	110	110	100	100	100	100	100	100	100	110	110	110					
29							120	110	110	100	110	(110)A	100	110	(110)A	110	(110)A	(100)A	100					
30							A	(110)A	110	110	110	110	100	(100)A	(100)A	(100)A	120	100	120					
31																								
Median							120	110	110	110	110	110	100	110	110	110	110	110	120	—				
Count							20	30	30	30	30	29	28	29	30	30	30	30	28	1				

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 49

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

IONOSPHERIC DATA

foE (Characteristic), Mc (Unit), April (Month), 1951

Observed at Washington, D. C.

Lat. 38.7°N, Long. 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: McC., A. C. K.

Calculated by: McC., A. C. K.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								2.2	2.7	3.1	$[3.2]^{B}$	3.3	B	B	3.2	B	B	2.6	B					
2								2.3	2.6	$(2.8)^{B}$	B	B^{K}	3.4^{K}	3.4^{K}	3.2^{K}	3.0^{K}	2.8^{K}	2.3^{K}	B^{K}					
3								2.2^{K}	2.5^{K}	$[2.8]^{B}_{K}$	$(3.0)^{B}_{K}$	$(3.1)^{B}_{K}$	$[3.1]^{B}_{K}$	3.1^{B}_{K}	3.1^{K}	2.9^{K}	2.7^{K}	2.3^{H}_{K}	1.9^{K}					
4								2.2^{K}	2.6^{K}	$[2.8]^{B}$	3.0	$(3.0)^{B}$	B	B	3.2	3.0	$(2.7)^{B}$	2.4	1.9					
5							B	2.3	2.6	2.8	3.0	3.1	3.2	3.2^{P}	3.1^{P}	3.0^{K}	2.7^{P}_{K}	2.6^{K}	2.0^{K}					
6								2.1^{P}_{K}	2.5^{P}_{K}	2.8^{P}_{K}	3.0	3.1^{P}	3.2	3.2^{P}	3.0	3.0	2.7	2.4	$(1.8)^{B}$					
7								2.2^{K}	2.5^{K}	2.9^{K}	2.9^{K}	$[3.0]^{B}_{K}$	3.1^{K}	3.2^{K}	3.1^{K}	2.9^{K}	$(2.7)^{B}_{K}$	2.3^{K}	B^{K}					
8							1.6	2.2	2.5	2.7^{P}	3.0	3.1	3.1	3.2	3.2	3.0	2.6	2.3	1.9					
9								2.0	2.5	2.9	3.1	3.1	3.2^{B}	3.2^{P}	$[3.1]^{B}$	3.0	2.8	2.4	1.9					
10								2.6^{P}	2.9	$[2.9]^{B}$	3.0	3.2	$(3.3)^{P}$	$[3.3]^{B}$	$(3.2)^{P}$	3.2	3.0	2.6^{P}	2.0					
11							1.8^{P}	2.4^{P}	$(2.7)^{P}_{K}$	3.1^{K}	3.2^{K}	3.3^{P}_{K}	3.4^{K}	3.5^{K}	3.4^{P}_{K}	3.3^{P}_{K}	3.1^{K}	2.7^{P}_{K}	1.9^{P}_{K}					
12							$(1.8)^{P}$	2.2^{P}	2.9	3.2	$[3.2]^{B}$	$(3.3)^{B}$	3.4^{P}	3.4	3.4	3.3	$[3.1]^{B}$	2.8^{K}	2.2^{K}					
13							B^{K}	2.2^{K}	2.8^{K}	3.1^{K}	3.3^{K}	$(3.4)^{P}_{K}$	3.5^{P}_{K}	3.5^{P}_{K}	3.4^{P}_{K}	3.3^{K}	3.1^{K}	2.6^{K}	A^{K}					
14							A	A	2.9	3.2^{H}	3.4	3.5	3.6^{H}	3.5	3.4^{P}	3.4	3.1	2.7	2.1					
15							1.9	2.5	3.0	3.1	3.3^{P}	3.4	3.5^{P}	$(3.4)^{B}$	3.4	3.3	3.1	2.7	2.1					
16							1.9	2.5	2.9	3.0^{H}	$[3.2]^{A}$	3.4	3.5	3.5	3.4	3.3	3.1	2.6	2.1^{H}					
17							1.9	2.5	3.0	3.1	3.3^{B}	3.5	3.6	3.6	3.3^{P}	$[3.2]^{A}$	3.1	A	A					
18							2.0^{K}	2.5^{K}	2.8^{K}	3.1^{P}_{K}	A^{K}	A^{K}	3.6^{K}	A^{K}	A^{K}	3.3^{P}_{K}	$[3.2]^{B}_{K}$	3.1^{P}_{K}	A^{K}					
19							2.0^{H}	2.6^{P}	3.1^{P}	$[3.2]^{A}$	3.4^{P}	B	B	$(3.7)^{B}$	3.5	3.3	3.0	2.7	2.2					
20							2.0^{P}	2.5	2.9^{K}	3.2^{K}	3.3^{K}	$(3.4)^{B}_{K}$	$(3.5)^{B}_{K}$	3.5^{P}_{K}	3.4^{K}	3.3^{K}	3.0^{K}	2.7^{K}	B^{K}	$(1.7)^{B}_{K}$				
21							2.2^{K}	2.7^{K}	3.1^{K}	3.2^{K}	3.4^{K}	3.5^{B}_{K}	3.5^{K}	3.5^{K}	3.4^{K}	3.2^{K}	3.0^{K}	2.6^{K}	2.1^{K}					
22							2.0^{P}_{K}	2.6^{K}	3.0^{K}	3.2^{K}	3.3^{K}	3.5^{K}	3.5^{P}_{K}	3.5^{K}	3.4^{K}	3.3^{K}	3.0	2.7	2.3^{H}					
23							2.0	2.7	3.0^{P}	3.2^{P}	3.4	3.6	$[3.6]^{B}$	3.6	3.6	3.4	3.1	2.8	2.2					
24							2.0	2.6	2.8	$[3.1]^{B}$	3.4	3.5	3.5	3.6	$[3.5]^{B}$	3.4	3.1	2.8	2.2					
25							2.2	2.6^{K}	2.9^{K}	3.1^{K}	3.3^{P}_{K}	$[3.4]^{B}_{K}$	$(3.4)^{B}_{K}$	$[3.4]^{B}_{K}$	3.4^{K}	3.2^{K}	3.1^{K}	2.7^{K}	2.2^{K}					
26							A	A	3.0	3.1	3.4	$[3.4]^{B}$	3.4	3.5	$[3.4]^{B}$	$(3.3)^{S}$	3.1	2.8	2.2					
27							2.0	2.6^{P}	3.0	3.2	3.3	$(3.4)^{A}$	$[3.4]^{A}$	3.5	$[3.4]^{A}$	3.3	3.1	$[2.7]^{A}$	2.3					
28							2.0	2.5^{H}	2.9	$(3.0)^{S}$	$(3.1)^{S}$	3.3	$[3.4]^{A}$	$(3.4)^{B}$	3.4	3.3	3.0	2.8	2.0					
29							2.0^{P}	2.6	3.0	3.2^{P}	A	A	A	3.5	$[3.4]^{A}$	3.3^{S}	3.1	2.8^{A}	A					
30							A	A	A	A	A	A	A	A	A	A	3.0	2.6	2.1					
31																								
Median							2.0	2.5	2.9	3.1	3.2	3.4	3.4	3.5	3.4	3.3	3.0	2.7	2.1	—				
Count							17	27	29	29	26	25	25	26	28	28	27	29	22	1				

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 50

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

IONOSPHERIC DATA

Es (Characteristic), Mc,Km (Unit), April (Month), 1951

National Bureau of Standards (Institution)

Observed at Washington, D. C.

Lat 38.7°N, Long 77.1°W

Scaled by: McC., A. C. K.

75°W Mean Time

Calculated by: McC., A. C. K.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	E	E	E	E	E
2	E	E	E	E	E	E	E	G	G	G	G	11.0/110	6.3/100	G	G	G	G	G	G	E	E	E	E	E
3	E	E	52/140	E	E	E	18/130	G	G	8.4Y/120	G	G	G	84/110	G	G	G	G	G	E	E	E	31/140	26/140
4	2.2/150	E	E	E	E	E	E	70Y/120	G	G	G	G	5.4Y/110	G	G	G	G	G	G	E	E	E	E	E
5	E	E	E	E	E	B	G	6.2/110	G	21.0/120	G	G	G	G	G	G	G	G	G	E	E	E	E	E
6	E	E	E	E	E	E	E	G	G	7.0Y/130	53Y/110	G	G	G	G	G	G	G	G	E	E	E	E	E
7	E	E	E	E	E	E	E	G	5.8/130	G	G	G	G	59Y/100	G	G	G	3.7/120	3.3Y/130	E	E	E	E	E
8	27/130	34/130	40S/120	E	E	E	G	G	G	G	G	68Y/110	G	G	G	G	G	G	36/120	E	E	E	E	E
9	E	E	E	E	E	22/100	G	G	G	74Y/130	G	G	G	46Y/130	G	G	G	G	G	E	27/110	2.5/110	E	E
10	E	E	E	E	25/110	E	33/100	G	G	G	98Y/100	G	G	G	G	G	G	G	G	E	E	E	E	E
11	E	E	E	E	E	E	G	G	G	86S/110	76Y/150	G	G	G	G	G	G	G	G	E	E	E	E	E
12	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	B	G	G	E	E	E	E	E
13	28/140	48/120	25/120	25/100	E	E	G	G	G	G	G	G	G	G	G	47/120	4.2/130	G	3.7/100	17/100	E	E	E	E
14	E	E	E	49/110	26/120	40/110	37/110	35Y/110	G	G	G	G	G	G	G	G	G	G	G	E	E	E	E	E
15	E	E	E	31/130	E	E	G	G	G	75Y/100	G	G	G	G	28/100	G	22/100	G	1.7/100	E	E	E	E	E
16	E	E	E	E	E	E	G	195/100	G	G	40/110	4.5Y/120	G	G	G	G	G	G	G	E	E	E	E	E
17	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	3.3/110	G	5.2/100	4.7/100	32/100	36/100	E	E	E
18	E	31/100	30/100	E	18Y/110	27/110	20/110	22/110	G	G	3.3/100	33/100	G	4.1/110	72Y/100	G	B	G	32/100	18/100	3.0/100	3.0Y/100	E	E
19	E	E	E	E	30Y/100	3.1/100	G	G	G	34/100	G	B	B	G	G	G	G	G	G	17/120	E	E	E	E
20	E	E	E	E	E	E	G	78/150	G	G	17.0/130	G	G	G	G	G	G	G	G	E	24/130	E	E	E
21	E	E	E	66Y/130	E	E	G	G	G	75Y/100	G	G	86Y/120	G	G	G	G	G	G	E	E	E	E	E
22	E	99Y/100	62/100	78Y/100	E	E	G	G	G	G	G	G	102Y/110	G	G	G	G	G	G	16/120	E	E	E	E
23	E	E	E	E	E	E	96/120	G	G	G	G	G	G	G	G	G	G	G	G	E	25/120	E	E	E
24	E	E	E	E	E	7.6Y/140	G	10.0/100	G	G	G	G	G	G	G	G	G	G	G	E	E	E	E	E
25	E	E	64Y/100	E	E	E	G	G	G	90Y/110	G	G	G	70/120	G	G	G	G	G	E	E	E	33/140	E
26	E	2.3/120	30/120	2.7/120	24/120	E	36/120	34Y/110	G	G	G	90Y/100	G	6.0/110	G	G	G	G	G	1.9/120	30/110	E	2.4/110	E
27	E	E	E	E	E	E	G	G	G	64Y/100	G	11.0/110	38/130	G	4.0/120	G	G	2.7/110	2.4/110	1.7/120	E	E	E	E
28	E	E	E	90Y/120	2.1Y/110	E	98Y/100	G	G	4.3/110	G	G	4.2/100	G	G	G	42/120	G	36/120	32/120	5.0/100	E	E	E
29	E	E	E	E	24Y/120	1.1/120	G	G	78/100	4.5/110	38/120	3.9/110	38/110	G	3.5/110	G	30/110	3.0/100	5.8/120	7.0/110	64/120	32/110	5.2/120	42/110
30	5.2/100	5.2/100	4.2/100	9.0Y/110	42/110	56Y/110	102Y/110	40/110	53/110	46/110	43/120	48/110	49/100	52/100	4.3/100	66Y/100	25/100	G	G	C	44/110	38S/110	3.7/110	2.2/110
31																								
Median	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
Count	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30

** MEDIAN fEs LESS THAN MEDIAN foE, OR LESS THAN LOWER FREQUENCY LIMIT OF RECORDER.

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 51

Central Radio Propagation Laboratory, National Bureau of Standards Washington 25, D.C.

IONOSPHERIC DATA

(M1500)F2 (Characteristic), ______ (Unit), April (Month), 1951

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: McC., A.C.K.

Calculated by: McC., A.C.K.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	1.9F	1.9F	1.9	(1.9)JS	(1.9)JF	(1.9)JF	2.1	2.4	2.3	2.3	2.2	2.2	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.0	1.9	1.9	1.8
2	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.3	2.1V	2.1V	2.0	1.8K	1.9K	1.8K	1.9K	2.0HK	2.0K	1.9K	2.0K	1.9K	2.1K	2.0K	2.0K	1.9SK
3	1.9SK	J(1.7)SK	J(1.6)SK	J(1.8)SK	1.8K	1.9K	2.1K	2.1K	2.0K	F1.6HK	1.8HK	F1.9SK	1.9K	1.9K	1.9HK	1.8K	1.7HK	1.9SK	2.0K	2.0K	2.1K	1.9K	K(1.7)JS	H(1.7)SK
4	1.8K	J(1.7)SK	(1.7)SK	S(1.7)FK	1.7FK	1.9FK	2.3FK	2.1K	2.0K	1.9	1.6	(1.9)JH	1.8	1.9	2.0	2.0	2.0	2.1	2.0	2.0	1.8	1.8F	1.8F	[illegible]
5	1.8F	(1.7)SJ	1.7F	(1.8)JF	1.9F	BS	2.0	2.0	1.8	1.8	1.7H	1.8F	2.0	2.1F	2.0	2.2K	2.0	2.0K	J(2.1)SK	2.1PK	J(2.2)K	P2.2SK	S(2.0)JK	
6	S(1.7)JK	(1.7)SK	K(1.8)JF	F1.8PK	F(1.6)SK	SK	2.1K	GK	GK	1.7K	1.7	2.0F	1.9F	1.9	(1.9)JH	1.9	(2.0)	2.1S	2.0	(2.1)S	(1.9)	(1.8)SF	1.8S	
7	1.8F	1.8S	2.0F	2.0F	(1.7)JS	BS	2.0	2.2K	GK	1.8K	GK	NK	1.9FK	1.8K	1.9K	1.9K	1.9K	2.2K	(2.0)JK	2.1SK	2.1K	1.8K	1.8K	
8	J(1.9)SK	J(2.2)FK	2.2FK	J(1.9)FK	J(1.8)BK	1.9K	2.1	2.0	2.0	2.0	2.1H	1.8	2.0	1.9	2.0	2.0	2.2	2.1	2.2S	2.0	2.0S	(1.9)JS	1.9S	[illegible]
9	1.9F	1.9FS	1.8SF	1.8F	1.8V	1.9F	2.2	2.2	2.3	2.0	2.0	2.0	1.9	1.9	2.0	2.1	2.1	2.1S	2.1	2.1	2.1S	1.7	(1.7)S	1.7
10	1.8	1.9V	1.9	(1.9)JS	2.1	(1.9)SP	2.2	2.2	2.3	2.1	2.0H	2.0	2.1	2.2	2.1	2.1	2.0	2.2	2.2	2.1	2.0S	1.9PS	1.9	1.9S
11	1.8S	1.8	1.9	2.0	2.0	2.0S	2.1	2.2	2.2K	1.7HK	1.8K	1.7K	(1.8)JK	1.8K	1.9K	2.0PK	2.0K	2.0K	2.1K	1.9K	1.9	1.9	1.9	1.9P
12	2.0	2.0P	2.0P	2.0P	1.9P	1.9	2.1	(2.1)JH	2.1	2.1	2.1	2.0	1.9	2.1	2.1	2.1	2.0	2.1K	2.0K	1.8K	1.9K	1.8K	1.8SK	1.9VK
13	1.8K	2.0VK	2.0VK	1.8K	1.9K	1.9K	2.0K	1.8K	1.9K	GK	1.7K	1.4K	1.6HK	1.8HK	1.8HK	1.9K	2.0K	2.0K	2.0K	2.1	2.0	1.7	1.8S	1.7
14	1.7	1.8F	1.8F	1.9	1.8F	2.0F	2.2	2.3V	2.2V	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.0	2.0	1.9	1.9V
15	1.8F	1.8F	1.9F	1.9	2.0F	1.9F	2.3	2.3	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0S	2.1S	2.0F	1.9F	(1.9)SF
16	1.8SF	1.9F	1.9SF	2.0SF	1.9	2.0	2.2S	2.4	2.3	2.2	2.2	1.9	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.2	2.1S	2.0	1.8	1.8
17	1.9	1.8	1.9	1.9	1.8	1.8	2.1	2.3	2.2	2.3	2.0H	2.0	1.9	2.0	2.0	2.0	2.0	2.1	2.1	(2.2)JS	2.0	1.9	1.8	1.8
18	1.8F	1.8	(1.8)FS	1.9F	1.9F	2.0F	2.2FK	2.1FK	1.6FK	GK	GK	GK	GK	1.4FK	1.6FK	1.6FK	1.7K	1.8K	2.0PK	2.0SK	1.9SF	1.8PS	1.9FS	1.9SF
19	1.8PF	1.7PF	1.7F	1.8F	1.8P	1.9F	2.2	2.2	2.0V	2.0H	1.8V	(2.0)B	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.1S	1.8S	1.8F	1.9F	1.8F
20	1.8F	1.7F	1.8S	1.7	1.7	1.8	2.0	1.9	2.0K	1.4K	1.5K	1.6K	1.6K	1.5K	1.6K	1.7K	1.6K	(1.8)HK	1.8K	1.9K	2.0K	1.8SK	1.9K	F1.8HK
21	F1.9VK	1.6VK	1.6HK	J(1.7)SK	S(1.8)HK	2.0FK	2.1K	2.1HK	2.2K	1.8HK	1.6K	1.8HK	1.7K	1.6K	1.7K	1.8K	1.8K	1.9K	1.9K	(1.9)SK	2.0K	1.9SK	1.8K	1.7SK
22	J(1.7)SK	K1.8FS	1.8FK	1.9FK	F1.6HK	1.7K	1.9K	1.7K	GK	GK	1.4PK	1.5K	1.7K	1.6K	1.6K	1.6K	1.7H	1.9F	2.0	2.0F	1.9	2.0	1.8	1.7
23	(1.7)FS	1.7	1.9F	1.9F	2.0F	1.9F	2.1	2.0H	1.8H	1.8H	1.7	1.7	1.7	1.8	1.8	1.9	1.8	1.9	1.9	2.0	1.9	1.8	1.8	1.8
24	1.8F	1.7F	1.8F	2.0	1.8F	1.8F	2.2F	1.9F	1.9	1.8	1.7	1.7	1.7	1.8	1.7	1.8	1.9	1.9	1.9	1.9	1.8	1.7	1.6	1.6
25	1.6	1.7FH	(1.7)F	1.7F	1.6F	1.8F	2.0	2.1K	1.7K	1.6K	GK	1.5K	1.5K	1.6K	1.6K	1.7K	1.7HK	1.8HK	1.9K	1.9K	1.8	1.8	1.7	1.8VF
26	1.8VF	1.9V	1.9V	1.8F	1.9F	1.9F	1.9F	1.9H	(1.9)H	2.0	2.1	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.1	2.1	1.9	2.0F	2.0F
27	1.9F	1.8F	1.8F	1.8	1.8F	1.8	2.0S	2.0H	2.0H	1.8	1.7	1.7	1.8	1.7	2.0	2.0	1.9	1.8	2.0	2.0	1.9	1.8S	1.9	1.9
28	1.7	1.8	1.9	2.0	2.0	1.9	2.1	2.1	(1.8)H	(2.0)JH	1.7H	1.8VH	1.7	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1	1.9	1.8	1.7
29	1.8	1.9	1.9	1.9	1.9	2.0	2.1	2.2H	2.2H	2.3H	(2.2)H	2.1	1.9	1.8	2.1	2.1	2.0	2.0	2.1	2.0	2.0	1.9	1.9	1.8
30	1.8	1.8F	1.8	1.8	2.0	2.1H	2.2H	2.3	2.2H	2.1H	2.0H	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	[2.0]C	2.0	1.9	1.8	1.8
31																								
Median	1.8	1.8	1.8	1.9	1.8	1.9	2.1	2.1	2.0	2.0	1.8	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.8	1.8
Count	30	30	30	30	30	27	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 52

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

Form adopted June 1946

(M3000)F2 (Characteristic), ____ (Unit), April (Month), 1951

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: McC., A.C.K.

Calculated by: McC., A.C.K.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.8F	2.8F	2.8	(2.9)JS	(2.9)JF	(2.8)JF	3.1	3.5	3.4	3.3	3.2	3.2	3.0	3.1	3.1	3.1	3.1	3.2	3.2	3.2	2.9	2.8	2.8	2.8
2	2.8	2.8	2.8	2.8	2.8	3.0	3.1	3.4	3.1V	3.1V	3.0	2.7K	2.8K	2.7K	2.8K	2.9HK	3.0K	2.8K	3.0K	2.9K	3.1K	2.9K	2.9K	2.8KS
3	2.9SK	K(2.6)JS	K(2.5)JS	K(2.7)JS	2.7K	2.8K	3.1K	3.0K	3.0K	K2.4FH	2.7HK	K2.8FS	2.8K	2.8K	2.9HK	2.8K	2.6HK	2.9SK	2.9K	3.0K	3.1K	2.8K	K(2.6)JS	K(2.6)HS
4	2.7K	K(2.6)JS	(2.6)SK	K(2.5)SF	2.6FK	2.8FK	3.3FK	3.1K	3.0K	2.8	2.4	(2.8)JH	2.7	2.8	2.9	2.9	3.0	3.0	2.9	2.9	2.7	2.7F	2.7F	2.7F
5	2.7F	(2.6)SJ	2.5F	(2.7)JF	2.8F	BS	3.0	3.0	2.7	2.7	2.6H	2.7F	3.0	3.1F	3.0	3.2K	3.0K	3.0K	K(3.0)JS	3.1PK	K(3.2)JS	K3.2PS	K(3.0)JS	2.8K
6	K(2.6)JS	K(2.6)JS	K(2.7)JF	(2.7)FP	K(2.5)FS	SK	3.2K	GK	GK	2.7K	2.6	3.0F	2.9F	2.9	(2.8)JH	2.8	(3.0)S	3.1S	3.0	(3.1)S	(2.8)S	(2.7)SF	2.7S	2.6
7	2.8F	2.8S	2.9F	3.0F	(2.6)JS	BS	3.0	3.2K	GK	2.7K	GBK	NK	2.8FK	2.8K	2.8K	2.8K	2.9K	3.2K	(3.0)JK	3.0SK	3.1K	2.7K	2.7K	2.7K
8	K(2.9)JF	K(3.2)JF	3.2FK	K(2.8)JF	K(2.6)JS	2.8K	3.2	3.0	2.9	3.0	3.1H	2.7	3.0	2.9	3.0	3.0	3.1	3.1	3.2S	3.0	3.0S	(2.9)JS	2.8S	2.8S
9	2.8F	2.8FS	2.7SF	2.7F	2.7V	2.9F	3.2	3.2	3.2	3.0	3.0	3.0	2.9	2.9	3.0	3.1	3.1	3.1S	3.1	3.1	3.1S	2.8	(2.7)S	2.6
10	2.7	2.8V	2.8	(2.9)JS	3.1	(2.9)SP	3.2	3.2	3.3	3.1	3.0H	2.9	3.1	3.2	3.1	3.1	3.0	3.2	3.2	3.1	3.0S	2.8PS	2.8	2.8S
11	2.7S	2.7	2.8	3.0	3.0	2.9S	3.1	3.2	3.2K	2.5HK	2.8K	2.6K	(2.7)JK	2.7K	2.9K	3.0PK	3.0K	3.1K	3.1K	2.8K	2.8	2.8	2.8	2.8P
12	3.0	3.0P	3.0P	3.0P	2.9P	2.9	3.1	(3.1)JH	3.1	3.2	3.1	3.0	2.8	3.1	3.1	3.0	3.0	3.0K	3.0K	2.7K	2.8K	2.7K	2.7SK	2.8VK
13	2.7K	3.0VK	3.0VK	2.7K	2.8K	2.8K	2.9K	2.7K	2.8K	GK	2.5K	2.2K	2.5HK	2.7HK	2.7HK	2.8K	3.0K	3.0K	2.9K	3.1	3.0	2.6	2.8S	2.6
14	2.6	2.7F	2.8F	2.8	2.7F	3.0F	3.2	3.3V	3.2V	3.1	3.0	3.1	3.0	3.0	3.0	3.1	3.0	3.0	3.1	3.2	3.0	3.0	2.9	2.8V
15	2.8F	2.7F	2.8F	2.9	3.0F	2.9F	3.3	3.3	3.4	3.3	3.1	3.1	2.9	2.9	3.0	3.0	3.0	3.0	3.1	3.0S	3.1S	3.0F	2.9F	(2.8)SF
16	2.8SF	2.8F	2.8SF	2.9SF	2.9	3.0	3.2S	3.4	3.4	3.2	3.2	2.9	2.9	2.9	2.9	3.0	3.1	3.0	3.0	3.2	3.1S	3.0	2.7	2.7
17	2.8	2.7	2.8	2.8	2.8	2.7	3.1	3.3	3.2	3.3	2.9H	2.9	2.9	3.0	3.0	3.0	3.0	3.1	3.1	(3.2)JS	3.0	2.9	2.8	2.7
18	2.7F	2.7	(2.7)FS	2.8F	2.8F	3.0F	3.2FK	3.1FK	2.4FK	GK	GK	GK	GK	2.2FK	2.4FK	2.5FK	2.6K	2.8K	3.0PK	3.0SK	2.8FS	2.7PS	2.8FS	2.9FS
19	2.7PF	2.6FP	2.6F	2.7F	2.7P	2.9F	3.3	3.2	3.0V	3.0H	2.8V	(3.0)B	2.9	2.9	2.8	2.9	3.0	3.0	3.0	3.1S	2.7S	2.7F	2.8F	2.7F
20	2.7F	2.6F	2.8S	2.6	2.6	2.8	3.0	2.9	2.9K	2.1K	2.2K	2.4K	2.4K	2.3K	2.4K	2.6K	2.4K	(2.7)HK	2.7K	2.8K	3.0K	2.7SK	2.8K	K2.7FH
21	K2.8FV	2.5VK	2.5HK	K(2.6)JS	K(2.7)SH	3.0FK	3.1K	3.0HK	3.2K	2.7HK	2.5K	2.7HK	2.6K	2.5K	2.6K	2.7K	2.7K	2.8K	2.8K	(2.8)SK	3.0K	2.7SK	2.7K	2.6HK
22	K(2.6)JS	K2.7FS	2.8FK	2.9FK	K2.5FH	2.6K	2.8K	2.6K	GK	GK	2.2PK	2.3K	2.6K	2.5K	2.5K	2.5K	2.5H	2.8F	2.9	3.0F	2.9	3.0	2.7	2.6
23	(2.6)FJ	2.6	2.9F	2.8F	2.9F	2.9F	3.1	3.0H	2.8H	2.7H	2.6	2.6	2.6	2.7	2.7	2.8	2.8	2.9	2.9	3.0	2.9	2.8	2.7	2.7
24	2.7F	2.5F	2.7F	2.9	2.7F	2.8F	3.2F	2.9F	2.9	2.7	2.5	2.6	2.6	2.7	2.6	2.7	2.8	2.8	2.8	2.8	2.7	2.6	2.5	2.5
25	2.5	2.6FH	(2.6)F	2.6F	2.5F	2.7F	3.0	3.1K	2.6K	2.4K	GK	2.3K	2.3K	2.4K	2.4K	2.6K	2.6HK	2.7HK	2.9K	2.9K	2.7	2.7	2.6	2.7VF
26	2.7VF	2.8V	2.8V	2.7F	2.8F	2.8F	2.8F	2.8H	(2.8)H	3.0	3.1	2.8	2.8	2.9	3.0	2.9	3.1	3.1	3.1	3.0	3.1	2.9	3.0F	3.0F
27	2.8F	2.7F	2.7F	2.7	2.7F	2.7	2.9S	2.9H	2.9H	2.7	2.6	2.6	2.8	2.6	3.0	3.0	2.8	2.7	2.9	3.0	2.9	2.7S	2.8	2.8
28	2.8	2.8	2.8	3.0	3.0	2.8	3.1	3.1	(2.7)H	(3.0)JH	2.6H	2.8VH	2.6	2.8	2.8	3.0	3.0	3.0	3.0	3.1	3.1	2.8	2.7	2.6
29	2.7	2.8	2.8	2.9	2.8	2.9	3.0	3.2H	3.2H	3.3H	(3.2)H	3.1	2.8	2.7	3.0	3.0	3.0	3.0	3.2	3.0	3.0	2.8	2.8	2.8
30	2.7	2.7F	2.7	2.7	3.0	3.1H	3.2H	3.3	3.2H	3.1H	3.0H	2.8	2.8	2.9	3.0	3.0	3.0	3.0	2.9	[3.0]C	3.0	2.9	2.7	2.7
31																								
Median	2.7	2.7	2.8	2.8	2.8	2.9	3.1	3.1	3.0	2.9	2.8	2.8	2.8	2.8	2.9	3.0	3.0	3.0	3.0	3.0	3.0	2.8	2.8	2.7
Count	30	30	30	30	30	27	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 53

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

(M3000)F1 (Characteristic), ____ (Unit), April (Month), 1951

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: McC., A.C.K.

Calculated by: McC., A.C.K.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L	L	4.0	3.7H	3.6	3.6	3.6	L	L	L	Q					
2								L	L	3.9	3.8H	3.4HK	3.4K	3.4K	3.6K	3.6K	3.4K	LK	QK					
3								QK	3.7K	3.6HK	3.5HK	3.6K	3.6HK	3.4K	3.3K	3.4K	3.4K	LK	LK					
4								QK	3.6K	3.5H	3.7	3.8	3.7	3.7H	3.6H	3.5	3.4H	L	L					
5								L	3.5	3.6	4.1	3.8H	3.6H	3.6	3.6H	3.5K	LHK	LK	LK					
6								3.4K	3.4K	3.8K	3.8	3.9	3.7H	3.4H	3.4	3.4	L	L	Q					
7								3.7K	(3.6)JK	3.9K	4.1K	4.1HK	4.0HK	3.7K	3.6HK	3.5HK	3.7HK	LK	QK					
8								L	3.4	3.6	3.8H	3.8	3.7	4.0	4.0H	3.4	3.5	3.6	Q					
9								L	3.5	3.5	3.5	3.5H	3.7	3.7	3.6	3.6	3.7	LH	L					
10								L	L	3.5	3.5	3.7	3.7	3.6H	3.6	3.6	3.6	L	L					
11							L	L	LHK	3.8K	3.8HK	3.9HK	3.7HK	3.9HK	3.5HK	3.5K	3.6HK	LK	LK					
12							Q	Q	3.4H	3.6	3.7	3.6P	S	3.6H	3.6	3.5H	B	LK	LK					
13							QK	3.4HK	K(3.5)HL	3.7K	3.7HK	3.6HK	3.5HK	3.4K	3.4K	3.5K	3.4K	3.5K	LK					
14							A	L	3.8	L	3.7	3.7H	3.6	3.6H	3.6	3.6	L	L	Q					
15							Q	L	L	LH	3.8	3.7	3.5H	3.7H	3.7H	3.5	L	L	Q					
16							Q	L	4.0	4.0	3.9	3.8	3.7	3.6	3.7	3.6	3.7	L	L					
17							L	LH	3.7	3.7	3.6	3.4	3.7H	3.5	3.4	3.6	3.6	L	L					
18							LK	LK	3.4K	3.6K	3.8K	4.0K	3.7K	3.5K	3.5K	3.6K	BK	3.2K	LK					
19							Q	L	3.7H	3.7H	L	B	3.6	3.6	3.6	3.5	3.7	L	L					
20							L	3.5	3.5K	3.6K	4.0HK	3.9K	3.7K	3.5K	3.5K	3.5K	3.3K	3.3K	BK					
21							LK	LK	3.7K	3.5K	3.8K	3.7K	3.6K	3.4HK	3.6K	3.5K	3.4K	3.3K	LK					
22							LK	3.3K	3.6K	3.7K	3.8K	3.6K	3.6K	3.7K	3.5K	3.4K	3.3H	3.4	L					
23							L	3.5	3.6H	3.8	3.8	3.8	3.5	3.6H	3.4	3.3	3.3H	L	L					
24							Q	L	3.4H	3.6	3.8H	3.7	3.6	3.4	3.4	3.5	3.5	3.4H	L					
25							L	LK	3.5K	3.6K	3.8K	3.7K	3.6K	3.5K	3.4K	3.4K	3.4K	3.4HK	LK					
26							A	3.7	3.7	3.7	3.9	3.6	3.4	3.6	3.6H	L	L	L	L					
27							L	3.4	L	3.6H	3.6H	3.6	3.6	3.5	3.6	3.5	3.3	L	L					
28							Q	L	3.6	3.5	3.7	3.6H	3.5H	3.6	3.4H	3.5	3.3	L	L					
29							L	L	4.1H	4.1H	(4.1)H	3.6	3.7	3.5H	3.6	3.6	3.6H	L	Q					
30							L	L	L	3.9	L	3.8H	3.5	3.7	3.7	3.5	3.6	L	L					
31																								
Median							—	3.4	3.6	3.6	3.8	3.7	3.6	3.6	3.6	3.5	3.4	3.4	—					
Count								8	23	27	28	29	29	30	30	28	22	8						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min.

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TABLE 54

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

(M1500)E (Characteristic), ____ (Unit), April (Month), 1951

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: McC., A.C.K.

Calculated by: McC., A.C.K.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								4.2	4.1	4.1	B	4.2	B	B	4.1	B	B	3.8	B					
2								3.8	4.2	(4.2)B	B	BK	4.1K	4.2K	4.2K	4.2K	4.3K	4.2K	BK					
3								4.4K	4.2K	BK	(4.3)BK	(4.1)BK	BK	(3.8)BK	4.1K	4.1K	4.1K	4.1HK	4.0K					
4								4.1K	4.1K	B	4.0	(4.1)B	B	B	4.1	4.1	(4.3)B	4.1	4.2					
5							B	4.2	4.2	4.2	4.2	4.2	4.2	4.2P	4.1P	4.1K	4.1PK	4.1K	4.2K					
6								4.2PK	4.2PK	4.2PK	4.1	4.3P	4.3	4.3P	4.3	4.3	4.2	4.1	(3.9)B					
7								4.2K	4.2K	4.1K	4.3K	BK	4.2K	4.2K	4.3K	4.0K	(4.2)BK	4.2K	BK					
8							4.5	4.2	4.2	4.2P	4.0	4.0	3.9	4.0	4.0	4.2	4.3	4.2	4.3					
9								4.4	4.3	4.3	4.3	4.3	4.1B	4.2P	B	4.2	4.2	4.2	4.2					
10								4.3P	4.4	B	4.2	4.3	(4.2)P	B	(4.4)P	4.2	4.2	4.3P	3.8					
11							4.2P	4.2P	(4.2)PK	4.0K	4.0K	4.2PK	4.1K	4.0K	4.0PK	4.2PK	4.5K	4.2PK	4.3PK					
12							(4.2)P	4.4P	4.3	4.5	B	(4.4)B	4.4P	4.3	4.4	4.2	B	4.3K	3.9K					
13							BK	4.4K	4.2K	4.1K	4.2K	(4.3)PK	4.2PK	4.2PK	4.3PK	4.1K	4.1K	4.1K	AK					
14							A	A	4.2	4.3H	4.3	4.2	4.3H	4.4	4.2P	4.1	4.2	4.1	3.8					
15							4.2	4.2	4.2	4.2	4.3P	4.3	4.3P	(4.3)B	4.2	4.2	4.0	4.2	3.9					
16							3.9	4.1	4.2	4.5H	A	4.3	4.3	4.3	4.4	4.2	4.3	4.3	4.0H					
17							4.1	4.3	4.3	4.2	4.2B	4.3	4.2	4.4	4.3P	A	4.4	A	A					
18							4.0K	4.0K	4.0K	4.2PK	AK	AK	4.3K	AK	AK	4.1PK	BK	4.2PK	AK					
19							4.3H	4.5P	4.4P	A	4.3P	B	B	(4.3)B	4.4	4.3	4.2	4.2	3.9					
20							4.1P	4.2	4.1K	4.3K	4.3K	(4.2)BK	(4.3)BK	4.1PK	4.2K	4.3K	4.2K	4.1K	BK					
21							3.8K	4.1K	4.1K	4.2K	4.2K	4.2BK	4.3K	4.2K	4.3K	4.2K	4.1K	4.1K	4.0K					
22							4.2PK	4.0K	4.1K	4.1K	4.1K	4.1K	4.2PK	4.2K	4.1K	4.1K	4.1	4.2	4.0H					
23							4.2	4.1	4.1P	4.4P	4.1	4.2	B	4.0	4.0	4.2	4.3	4.4	4.0					
24							4.1	4.2	4.3	B	4.2	4.2	4.3	4.3	B	4.2	4.2	4.1	3.9					
25							3.8	4.2K	4.2K	4.2K	4.2PK	BK	(4.1)BK	BK	4.2K	4.2K	4.1K	4.2K	4.1K					
26							A	A	4.4	4.3	4.2	B	4.2	4.3	B	(3.9)S	4.0	4.1	4.1					
27							4.1	4.1P	4.2	4.1	4.1	(4.1)A	A	3.9	A	4.2	4.3	A	3.7					
28							4.0	4.0H	4.2	(4.4)S	(4.3)S	4.2	A	(3.9)B	4.1	4.1	4.2	4.2	4.1					
29							3.8P	4.1	4.4	4.4P	A	A	A	4.5	A	4.2S	4.3	4.2A	A					
30							A	A	A	A	A	A	A	A	A	A	4.3	4.2	4.1					
31																								
Median							4.1	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.0					
Count							17	27	29	24	23	22	21	24	23	27	27	28	22					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

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Table 55

Ionospheric Storminess at Washington, D. C.

April 1951

Day	Ionospheric character* 00-12 GCT	Ionospheric character* 12-24 GCT	Principal storms Beginning GCT	Principal storms End GCT	Geomagnetic character** 00-12 GCT	Geomagnetic character** 12-24 GCT
1	1	2			2	1
2	1	4	1600	----	3	4
3	4	4	----	----	4	4
4	4	3	----	1400	4	5
5	3	3	1900	----	5	4
6	4	3	----	1500	4	4
7	2	4	1200	----	4	4
8	4	3	----	1100	4	3
9	3	2			4	3
10	2	2			4	3
11	1	5	1300	----	4	2
12			----	0100		
	0	2	2200	----	3	2
13	4	4	----	2400	4	4
14	2	3			4	2
15	1	3			2	2
16	1	3			1	2
17	1	2			3	2
18	2	6	1100	----	3	5
19	3	1	----	0100	3	2
20	1	5	1300	----	3	4
21	4	4	----	----	5	3
22	4	4	----	2100	4	4
23	2	3			3	2
24	2	2			4	4
25	2	5	1200	----	5	4
26	2	3	----	0100	3	2
27	2	1			2	3
28	1	2			2	2
29	2	3			3	2
30	3	3			1	2

* Ionosphere character figure (I-figure) for ionospheric storminess at Washington, D. C., during 12-hour period, on an arbitrary scale of 0 to 9, 9 representing the greatest disturbance.

** Average for 12 hours of Cheltenham, Maryland, geomagnetic K-figures on an arbitrary scale of 0 to 9, 9 representing the greatest disturbance.

---- Dashes indicate continuing storm.

Table 56

Provisional Radio Propagation Quality Figures
(Including Comparisons with CRPL Warnings and Forecasts)
March 1951

Day	North Atlantic quality figure, Half day GCT (1)	North Atlantic quality figure, Half day GCT (2)	CRPL* Warning, Half day GCT (1)	CRPL* Warning, Half day GCT (2)	CRPL** Forecast (J-reports)	North Pacific quality figure, Half day GCT (1)	North Pacific quality figure, Half day GCT (2)	Geomagnetic K_{Ch}, Half day GCT (1)	Geomagnetic K_{Ch}, Half day GCT (2)
1	(4)	5	W	U		(3)	5	3	2
2	5	5				(4)	5	1	2
3	5	6				(4)	6	3	2
4	6	6				5	5	2	2
5	7	6				7	6	2	1
6	6	7				6	5	3	3
7	5	5			X	5	(4)	3	(4)
8	(2)	(4)	W	W	X	(4)	(4)	(4)	(4)
9	(3)	5	W	W	X	(4)	5	(4)	(4)
10	(3)	(3)	W	W	X	(3)	(4)	(4)	3
11	(2)	(4)	W	W	X	(4)	(4)	(4)	3
12	(2)	(4)	W	U		(4)	(4)	(4)	3
13	(2)	(4)	W	W		(4)	(3)	(4)	(5)
14	(2)	(3)	W	W	X	(3)	(4)	(4)	(4)
15	(2)	6	W	U		(3)	5	3	2
16	(4)	5		(U)		5	5	3	3
17	(3)	(4)	U	U		(4)	5	3	3
18	(4)	(4)	W	U		(4)	5	3	3
19	(4)	6	U			5	6	3	2
20	5	7				5	5	2	2
21	5	7				6	6	2	2
22	6	6		W	X	6	5	(4)	(5)
23	(3)	5	W	W	X	(4)	(4)	3	(4)
24	(4)	5	W	U		5	6	3	3
25	(4)	5	U	U		5	6	3	3
26	6	6			X	7	7	3	2
27	5	5	W		X	5	5	(4)	1
28	6	5				7	7	1	2
29	5	6				6	6	3	4
30	(4)	5	U	U		8	8	3	2
31	6	6				6	5	2	2

Score:	Warning N.A.	Warning N.P.	Forecast N.A.	Forecast N.P.
H	28	26	10	12
(M)	1	0	0	0
M	1	3	15	10
G	27	25	27	32
O	5	8	10	8

Scales:
Quality Figures
(1)- Useless
(2)- Very poor
(3)- Poor
(4)- Poor to fair
5 - Fair
6 - Fair to good
7 - Good
8 - Very good
9 - Excellent

Geomagnetic K_{Ch} - 0 to 9, 9 representing the greatest disturbance; $K_{Ch} \geq 4$ indicates significant disturbance, enclosed in ( ) for emphasis.

Symbols:
W Disturbed conditions expected
U Unstable conditions expected
N No disturbance expected
X Probable disturbed date

Scoring:
H Storm ($Q \leq 4$) hit
(M) Storm severer than predicted
M Storm missed
G Good day forecast
O Overwarning

Scoring by half day according to following table:

	Quality Figure ≤ 3	4	5	≥ 6
W	H	H	O	O
U	(M)	H	H	O
N	M	M	G	G
X	H	H	O	O

*Broadcast on WWV, Washington, D.C. Times of warnings recorded to nearest half day as broadcast. ( ) broadcast for one-quarter day. Blanks signify N.

**In addition to dates marked X, the following were designated as probable disturbed days on forecasts more than eight days in advance of said dates: March 21 and 24.

Table 57

Zürich Provisional Relative Sunspot Numbers

April 1951

Date	R_Z*	Date	R_Z*
1	41	17	130
2	27	18	148
3	24	19	150
4	20	20	132
5	40	21	149
6	61	22	144
7	69	23	140
8	78	24	119
9	75	25	115
10	74	26	114
11	84	27	114
12	88	28	98
13	78	29	81
14	103	30	65
15	118		
16	126	Mean:	93.5

*Dependent on observations at Zürich Observatory and its stations at Locarno and Arosa.

Note: The American sunspot numbers for April will appear in a later issue of this bulletin.

Table 58a

Coronal observations at Climax, Colorado (5303A), east limb

Date GCT	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Apr. 2.6	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	8	8	8	10	10	10	5	3	3	3	3	3	3	3	2	2	2	2	2	-	-	-
3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	5	8	10	10	5	3	5	3	3	3	3	3	2	-	-	-	-	-	-	-
13.8	-	-	-	-	-	-	-	-	-	2	2	3	3	5	17	17	15	25	12	8	5	5	3	3	3	3	3	-	-	-	-	-	-	-	-	-	-
14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	5	8	10	3	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
16.6	-	-	-	-	-	-	-	-	-	-	3	3	5	5	8	8	10	8	3	4	4	3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
21.9	X	-	-	-	-	-	-	-	3	5	3	3	5	10	12	5	3	3	3	3	3	3	3	3	3	2	-	-	-	-	-	-	-	-	-	-	-
25.6	-	-	-	-	-	-	-	3	3	3	3	5	3	8	10	12	15	8	3	5	10	12	8	3	2	-	-	-	-	-	-	-	-	-	-	-	-
27.7	X	X	X	X	X	X	X	X	X	X	X	X	5	5	8	8	5	3	3	3	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-	X	X
28.6	-	-	-	-	-	-	-	2	3	3	3	3	3	10	12	12	10	10	5	8	5	5	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-

Table 59a

Coronal observations at Climax, Colorado (6374A), east limb

Date GCT	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Apr. 2.6	2	2	2	2	2	2	2	2	2	3	3	3	3	2	3	8	5	3	2	3	5	2	2	3	3	3	3	2	2	3	3	3	3	3	3	2	3
3.8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	5	2	5	5	2	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
13.8	3	2	2	2	-	-	-	-	-	-	-	2	3	3	12	3	8	12	8	3	2	8	8	8	10	3	3	5	3	3	5	3	2	2	2	2	2
14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-
16.6	-	2	2	2	2	2	2	2	2	2	2	2	3	3	3	5	3	3	2	2	8	8	2	2	2	2	2	3	3	3	2	2	2	2	2	2	2
21.9	X	3	3	3	3	2	2	2	2	-	-	2	3	8	8	5	3	2	2	2	3	3	3	3	2	2	3	3	3	3	3	3	3	3	3	3	3
25.6	2	2	3	3	3	2	-	-	-	-	-	-	-	-	2	12	15	15	5	10	17	5	15	5	5	8	3	3	2	2	2	2	2	2	2	2	2
27.7	X	X	X	X	X	X	X	X	X	X	X	X	2	3	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	X	X
28.6	2	2	2	2	2	2	-	2	-	-	2	2	2	3	12	10	5	2	2	2	3	3	3	5	3	3	3	3	3	2	2	2	3	3	2	2	2

Table 60a

Coronal observations at Climax, Colorado (6702A), east limb

Date GCT	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Apr. 2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
13.8	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	5	8	8	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.9	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.6	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	2	-	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
27.7	X	X	X	X	X	X	X	X	X	X	X	X	2	3	3	3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X
28.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 58b

Coronal observations at Climax, Colorado (5303A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Apr. 2.6	-	-	-	-	-	-	-	-	-	-	2	2	3	3	5	8	12	10	5	12	12	15	12	15	12	5	3	5	3	3	-	-	-	-	-	-	-
3.8	-	-	-	-	-	-	-	-	-	-	-	3	3	3	10	12	10	5	5	15	20	20	15	12	12	5	3	3	3	3	3	-	-	-	-	-	-
13.8	-	-	-	-	-	-	-	-	-	-	-	2	3	3	2	2	3	3	5	12	15	15	12	8	3	3	3	3	3	3	3	3	-	-	-	-	-
14.7	-	-	-	-	-	-	-	-	-	-	-	3	3	2	3	3	5	8	5	8	8	10	10	5	3	3	3	-	2	3	2	-	-	-	-	-	-
16.6	-	-	-	-	-	3	3	3	3	3	3	3	3	3	3	8	10	5	3	3	3	3	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-
21.9	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25.6	-	-	-	-	-	-	2	2	2	3	3	2	2	3	8	15	17	12	10	15	20	28	12	15	10	5	5	3	3	3	2	-	-	-	-	-	-
27.7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
28.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	8	12	15	10	8	10	5	3	3	2	2	2	-	-	-	-	-	-	-

Note: Yellow line (5694A): Apr. 25.6 at N10-N20, intensity 3.

Table 59b

Coronal observations at Climax, Colorado (6374A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Apr. 2.6	3	3	3	3	2	3	3	3	3	2	2	2	2	2	5	8	12	2	3	10	10	10	8	5	3	3	2	2	2	2	2	2	2	2	2	2	2
3.8	2	2	2	2	2	5	5	3	3	5	3	3	2	2	12	8	10	8	5	5	31	15	10	12	5	2	2	2	3	2	2	2	2	2	2	2	2
13.8	2	3	3	3	3	3	3	3	2	3	2	3	10	8	8	5	8	10	3	12	12	10	15	2	3	2	2	2	2	2	2	2	2	2	2	2	3
14.7	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	3	12	8	3	3	2	2	8	3	2	2	2	2	2	-	-	-	-	-	-	-	-
16.6	2	2	2	2	2	2	-	-	-	-	-	-	-	-	2	8	14	15	8	2	2	2	3	3	2	2	2	2	2	2	-	-	-	-	-	-	-
21.9	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25.6	2	2	3	3	2	3	2	2	3	3	2	3	3	5	10	3	10	2	15	8	12	5	12	3	10	2	-	2	3	2	2	3	2	3	2	2	2
27.7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
28.6	2	2	2	2	2	-	-	-	-	2	2	3	3	2	2	2	2	2	2	3	10	-	5	3	2	2	-	2	2	-	-	-	-	-	-	-	2

Table 60b

Coronal observations at Climax, Colorado (6702A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Apr. 2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	3	3	2	-	-	-	-	-	-	-	-	-	-	-
3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	3	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-
13.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	3	3	3	2	-	-	-	-	-	-	-	-	-	-	-	-
14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-
16.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.9	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25.6	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	5	5	3	3	5	10	8	5	4	3	2	2	2	2	2	-	-	-	-	-	-	-
27.7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
28.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	2	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-

Table 61a

Coronal observations at Sacramento Peak, New Mexico (5303A), east limb

Date GCT	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Apr. 1.7	-	-	-	-	-	-	-	-	-	-	3	3	3	5	5	8	10	12	10	12	10	8	5	5	3	3	5	5	3	3	-	-	-	-	-	-	-
2.8	-	-	-	-	-	-	-	-	3	3	3	3	3	3	5	10	10	10	12	13	13	12	8	8	8	8	5	5	5	5	3	-	-	-	-	-	-
3.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	5	8	8	8	10	10	10	8	8	8	3	3	3	5	3	-	-	-	-	-	-	-
5.9a	-	-	-	-	-	-	-	-	-	-	-	3	3	5	15	12	12	15	12	10	10	12	15	15	12	10	10	8	-	-	-	-	-	-	-	-	-
8.7	-	-	-	-	-	-	-	3	3	3	5	3	8	5	8	10	8	3	5	12	15	8	5	3	3	3	3	3	3	5	5	3	3	-	-	-	-
9.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	8	8	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.7	-	-	-	-	-	-	-	-	3	3	5	8	10	12	12	31	28	3	10	25	25	17	10	10	8	8	5	5	3	5	3	3	-	-	-	-	-
11.8	-	-	-	-	-	-	2	3	3	3	5	5	10	10	12	28	18	15	12	15	20	15	12	8	5	3	3	3	3	3	3	3	-	-	-	-	-
12.8	-	-	-	-	-	2	3	3	3	3	5	8	8	10	15	31	17	15	33	12	15	10	8	8	5	3	3	3	3	3	3	-	-	-	-	-	-
13.7	-	-	-	-	-	-	-	3	3	5	8	8	8	12	25	33	28	33	41	20	10	10	8	8	5	5	5	5	-	-	-	-	-	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	3	3	5	8	8	10	20	20	25	28	12	10	10	8	5	3	3	3	3	3	3	-	-	-	-	-	-	-
16.8	-	-	-	-	-	-	-	-	-	-	3	8	8	10	12	12	12	13	13	13	8	8	8	5	5	3	3	3	3	-	-	-	-	-	-	-	-
18.7	-	-	-	-	-	-	-	-	-	3	3	5	5	8	12	15	15	15	8	5	8	10	12	8	5	3	3	-	-	-	-	-	-	-	-	-	-
21.7	-	-	-	-	-	-	-	-	3	5	12	12	12	15	22	22	20	15	12	10	10	12	12	12	8	5	3	-	-	-	-	-	-	-	-	-	-
22.7	-	-	-	-	-	-	3	3	5	8	10	12	15	17	15	15	13	8	8	10	12	10	12	10	8	5	3	-	-	-	-	-	-	-	-	-	-
23.6	-	-	-	-	-	-	3	3	5	5	5	5	8	8	8	10	10	8	8	8	10	12	12	14	10	8	3	-	-	-	-	-	-	-	-	-	-
25.7	-	-	-	-	-	3	5	8	10	5	8	8	10	10	15	20	31	25	15	12	20	20	22	12	8	5	3	3	-	-	-	-	-	-	-	-	-
27.9	-	-	-	-	-	3	5	5	5	5	8	10	8	12	25	33	28	22	15	15	20	12	8	8	5	5	3	-	-	-	-	-	-	-	-	-	-
29.6	-	-	-	-	-	-	3	3	3	3	5	5	5	8	10	12	15	10	12	15	17	20	5	5	5	3	3	3	3	3	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	3	3	3	5	5	8	5	5	8	8	12	25	10	5	3	3	3	3	3	-	-	-	-	-	-	-	-

Notes: Yellow line (5694A): Apr. 10.7 at N10-N15, intensity 5; Apr 11.8 at N10-N15, intensity 4.

Table 62a

Coronal observations at Sacramento Peak, New Mexico (6374A), east limb

Date GCT	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Apr. 1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-
2.8	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	3	3	3	3	5	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3.8a	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
5.9a	-	-	-	-	-	-	2	3	3	3	3	2	2	2	3	3	8	10	3	2	10	8	12	5	2	-	-	-	-	-	-	-	-	-	-	-	-
8.7	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	12	10	5	4	8	10	5	3	2	2	2	2	2	3	3	2	2	2	2	2	2	2
9.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2
10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	2	12	2	8	8	12	5	2	5	8	3	2	2	2	2	-	-	-	-	2	2	2
11.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	3	3	8	5	3	10	2	2	3	2	2	2	-	-	-	-	-	-	-	-	-
12.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	8	5	2	8	12	3	12	6	5	3	2	2	2	-	-	-	-	-	-	-	-	-
13.7	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	10	3	10	12	3	2	3	8	8	8	5	2	3	-	-	-	-	-	-	2	2	2
14.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	12	3	2	2	5	4	4	3	3	3	3	3	3	2	2	2	2	2	-
16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	5	8	5	2	3	5	8	2	2	2	2	3	3	3	-	-	-	-	-	-	-
18.7	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	8	5	12	-	2	12	10	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-
21.7	2	3	2	2	3	2	2	2	2	2	2	2	2	3	5	8	10	5	2	3	5	5	3	2	2	3	3	3	3	3	2	2	2	3	2	3	3
22.7	3	2	2	2	2	2	2	2	2	2	2	2	2	3	8	5	8	8	5	5	5	3	5	5	3	3	3	5	5	5	2	3	2	3	2	3	2
23.6	2	2	3	3	3	3	2	2	-	-	-	-	2	2	3	3	3	10	8	8	12	10	12	2	3	2	2	2	3	5	3	2	2	2	2	2	3
25.7	3	3	2	2	2	2	2	2	2	2	-	-	-	-	-	2	15	12	15	10	15	12	5	13	3	3	5	3	3	3	3	2	2	2	2	2	3
27.9	2	3	3	2	2	2	2	2	3	2	2	2	2	2	5	20	15	5	3	5	8	5	10	8	5	8	8	3	3	3	2	2	2	2	2	3	3
29.6	2	2	3	3	2	2	2	2	2	2	2	5	8	10	5	5	5	3	5	5	8	5	3	8	8	8	5	2	3	2	2	2	3	2	2	2	5
30.6	2	2	2	-	-	-	-	-	2	2	3	3	3	2	2	3	2	2	3	5	5	3	3	3	5	3	3	3	3	3	3	2	2	2	2	2	2

Table 61b

Coronal observations at Sacramento Peak, New Mexico (5303A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Apr. 1.7	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	8	12	13	13	12	12	13	13	14	12	8	3	3	3	3	-	-	-	-	-	-	-
2.8a	-	-	-	-	-	-	-	-	-	5	5	5	5	5	8	15	20	25	15	12	12	13	15	12	15	10	8	5	5	3	-	-	-	-	-	-	-
3.8a	-	-	-	-	-	-	-	-	3	3	3	3	3	5	8	10	12	10	8	12	20	22	17	15	10	12	5	5	3	3	-	-	-	-	-	-	-
5.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	5	5	5	8	10	8	8	5	5	5	5	3	3	3	3	3	-	-	-	-	-
8.7	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	5	8	10	5	5	3	5	8	10	15	12	10	8	5	3	-	-	-	-	-	-	-
9.8	-	-	-	-	-	-	-	-	5	5	8	8	10	10	12	13	12	10	8	12	12	10	5	3	-	-	-	-	-	-	-	-	-	-	-	-	-
10.7a	-	-	-	-	-	-	-	-	-	-	-	-	3	5	8	12	17	12	5	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
11.8	-	-	-	-	-	-	-	-	-	-	-	3	3	5	10	13	8	8	5	3	5	8	10	10	8	8	8	5	3	3	-	-	-	-	-	-	-
12.8	-	-	-	-	-	-	-	-	-	-	-	3	3	3	5	8	8	8	8	12	20	25	15	12	12	10	8	5	8	10	3	-	-	-	-	-	-
13.7	-	-	-	-	-	-	-	-	-	-	-	3	3	3	5	5	8	10	10	15	22	25	20	17	14	8	8	8	8	8	3	-	-	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	8	10	12	15	15	15	18	18	15	8	5	3	3	3	3	3	-	-	-	-	-	-
16.8	-	-	-	-	-	-	-	-	-	3	3	3	3	5	8	10	12	15	22	15	5	5	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
18.7a	-	-	-	-	-	-	-	-	3	3	3	3	3	5	8	8	8	12	10	5	5	5	3	3	3	-	-	-	-	-	-	-	-	-	-	-	-
21.7	-	-	-	-	-	-	3	3	5	5	5	8	8	8	5	5	8	8	10	5	5	8	8	8	8	8	8	8	3	3	-	-	-	-	-	-	-
22.7	-	-	-	-	-	-	-	3	3	5	8	8	8	8	5	8	8	12	15	12	12	13	13	15	15	15	13	10	5	3	3	5	5	5	3	-	-
23.6	-	-	-	-	-	-	3	5	8	8	5	8	8	5	8	8	8	15	38	15	20	20	18	18	20	18	15	12	8	5	3	3	3	-	-	-	-
25.7	-	-	-	-	-	-	-	2	3	3	3	5	8	8	10	12	15	15	12	33	35	38	25	31	12	10	8	5	5	3	3	-	-	-	-	-	-
27.9a	-	-	-	-	-	-	-	-	-	3	3	5	5	5	8	8	8	8	20	35	38	41	25	17	15	10	5	5	5	3	3	3	-	-	-	-	-
29.6	-	-	-	-	-	-	3	3	3	3	3	5	8	8	10	10	10	12	15	15	22	20	15	12	10	10	8	8	5	3	3	-	-	-	-	-	-
30.6	-	-	-	-	-	3	5	5	5	5	5	5	5	8	5	5	8	13	10	10	12	15	17	13	12	15	12	10	X	X	X	X	X	X	X	X	X

Note: Yellow line (5694A): Apr. 25.7 at N10-N15, intensity 5.

Table 62b

Coronal observations at Sacramento Peak, New Mexico (6374A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Apr. 1.7	-	-	-	-	-	-	2	3	3	3	2	2	2	-	-	2	5	12	2	3	3	3	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-
2.8a	2	2	-	-	-	-	2	3	3	3	3	3	2	2	5	3	8	12	3	2	5	5	5	5	5	3	2	2	-	-	-	-	-	-	-	-	-
3.8a	-	-	-	-	-	-	-	2	2	3	3	-	-	-	2	8	3	3	3	2	12	18	10	5	8	2	-	-	-	-	-	-	-	-	-	-	-
5.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	2	2	8	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
8.7	2	2	-	-	-	-	-	2	5	3	5	3	2	-	3	8	5	2	3	2	3	3	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2
9.8	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	5	3	5	5	3	2	2	2	2	2	-	-	-	-	-	-	-	-	-
10.7a	2	2	2	2	2	2	2	2	3	3	2	2	2	2	8	14	12	10	5	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
11.8	-	-	-	-	-	-	2	3	3	3	3	3	5	3	5	12	13	8	8	10	8	8	10	2	2	-	-	-	-	-	-	-	-	-	-	-	-
12.8	-	-	-	-	-	-	-	3	3	3	3	3	3	8	10	12	10	8	5	3	8	14	12	2	-	-	-	-	-	-	-	-	-	-	-	-	-
13.7	2	2	2	2	2	2	2	2	2	2	2	3	3	5	3	2	3	5	3	5	10	8	12	5	3	3	2	2	2	2	2	-	-	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	-	-	2	3	3	2	2	3	10	3	2	2	3	10	5	2	3	2	-	-	-	-	-	-	-	-	-	-
16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	20	15	2	3	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-
18.7a	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	2	8	10	3	3	3	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-
21.7	3	3	3	2	2	2	2	2	2	2	2	2	2	5	2	2	3	2	5	3	5	3	2	2	2	2	2	2	-	-	-	-	-	-	-	2	2
22.7	2	2	3	2	2	3	3	3	2	2	2	3	8	5	3	2	3	8	13	12	12	2	2	2	2	3	3	2	3	3	3	2	2	2	3	3	3
23.6	3	2	2	3	3	2	2	2	2	2	2	3	2	2	2	3	8	10	15	8	12	8	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
25.7	3	3	3	3	3	3	2	2	2	2	3	2	3	5	8	10	10	2	15	10	12	3	10	3	12	2	3	3	3	2	3	3	3	2	3	3	3
27.9a	3	3	2	2	2	2	2	3	3	3	3	5	8	10	8	3	2	2	5	8	10	8	12	5	2	3	2	3	3	2	2	2	3	3	3	3	2
29.6	5	3	3	2	2	2	2	2	3	5	5	5	3	3	3	2	3	8	12	5	8	3	2	3	3	5	3	3	3	3	2	2	3	2	3	2	2
30.6	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	3	5	12	8	2	4	3	2	2	2	3	2	X	X	X	X	X	X	X	X	2	2

Table 63a

Coronal observations at Sacramento Peak, New Mexico (6702A), east limb

Date	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Apr. 1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
3.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-
10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	4	4	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-
11.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	3	4	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	5	3	3	3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	5	5	3	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	5	3	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	2	5	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.7	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.7	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.6	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	5	3	2	2	2	2	3	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
27.9	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 63b

Coronal observations at Sacramento Peak, New Mexico (6702A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Apr. 1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
2.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	5	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-
5.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.8	-	-	-	-	-	-	-	-	2	2	2	2	3	3	3	3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
11.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-
13.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-
16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-
21.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	3	3	3	2	-	-	-	-	-	-	-	-	-
23.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	3	3	3	3	3	2	2	2	2	-	-	-	-	-	-	-	-	-
25.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	2	2	3	5	5	5	5	2	2	2	2	2	-	-	-	-	-	-	-	-
27.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	5	5	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-
29.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 64

Outstanding Solar Flares, March 1951

Observatory	Date 1951	Time Observed Beginning (GCT)	Time Observed Ending (GCT)	Duration (Min)	Area (Mill (of) (Visible) (Hemisph)	Position Longitude Diff (Deg)	Position Latitude (Deg)	Time of Maximum (GCT)	Int. of Maximum	Relative Area of Maximum (Tenths)	Importance	SID Observed
Sacramento Peak	Mar. 1	1820	2025	125	305	E27	S12	1846	20	6		
McMath	" 1	1835				E16*	S13*				1+	
Sacramento Peak	" 1	2149	2215	26	53	W74	N09	2151	10	8		
"	" 5	1905	1945	40	52	W29	S13	1908	15	8		
"	" 11	1805	2010	125	126	E27	S03	1823	15	4		
"	" 11	1830	2025	115	116	E07	N14	1909	15	4		
"	" 11	2250	2342	52	53	E90	S03	2255	20	9		
"	" 13	1733	1820	47	95	W17	N13	1749	15	5		
"	" 13	1808	1933	85	180	E01	S03	1824	15	3		
"	" 13	1820	2131	191	242	W17	N13	1918	20	2		
"	" 19	1550	1625	35	21	E59	N05	1608	20	8		
"	" 19	1603	2000	237	63	E48	N12	1613	15	5		
"	" 20	2010	2140	90	52	E25	N13	2020	15	7		
"	" 21	1440	1540	60	190	E36	N09	1458	25	4		
"	" 21	1457	1545	48	126	E19	N13	1507	10	9		
"	" 21	2215	2250	35	63	W49	N19	2228	10	7		
"	" 22	2220	---	--	53	E06	N08	2225	15	4		
"	" 23	1635	1650	15	74	E64	N10	1646	10	6		
"	" 23	1651	1703	12	95	W08	N15	1658	20	4		
"	" 23	1655	1714	19	105	E01	N10	1701	15	3		
"	" 23	1910	1935	25	53	W18	S09	1921	15	7		
"	" 23	1925	2015	50	42	W01	N08	1936	15	7		
"	" 23	2104	2113	9	53	W15	N14	2110	15	8		
"	" 23	2120	2145	25	158	W10	N15	2129	25	6		
Edinburgh	" 24	1135				W15	N15				3	Yes
Nav. Obs.	" 24	1605				W21*	N12*					
McMath	" 24	1930				W14*	N12*				1+	
"	" 26	1747				S10*	W57*				1	
Sacramento Peak	" 31	2210	2245	35	63	E50	S14	2220	10	5		

*Longitude and latitude of calcium or solar area in which solar flare was observed.

Table 65

Indices of Geomagnetic Activity for March 1951

Preliminary values of mean K-indices, Kw, from 38 observatories;
Preliminary values of international character-figures, C;
Geomagnetic planetary three-hour-range indices, Kp;
Magnetically selected quiet and disturbed days

Gr. Day 1951	Values Kw	Sum	C	Values Kp	Sum	Final Sel. Days
1	3.7 3.3 2.2 3.0 3.0 2.3 1.5 1.3	20.3	0.8	4+4+3-3+ 3o2+1+1+	23-	Five
2	0.4 0.6 1.4 1.9 2.9 2.1 1.6 2.6	13.5	0.5	0o0+1+2o 3+2+1+2+	13o	Quiet
3	1.6 2.0 3.1 2.3 2.0 2.3 1.5 0.7	15.5	0.4	2-3o4o3- 2o2+2-1-	18o	
4	0.2 2.1 2.2 1.3 1.7 1.3 1.5 3.0	13.3	0.4	0o3o3o1+ 2o1+1+3o	15o	2
5	0.7 1.5 2.0 1.4 1.3 1.5 1.3 0.8	10.5	0.1	0+2o3-2- 1o2-1o0+	11-	4
						5
6	1.3 2.6 4.2 3.2 3.4 2.8 2.8 2.6	22.9	0.9	1+3+5o3+ 3+3-3-3-	24+	21
7	2.9 2.6 2.4 3.8 5.1 4.2 4.8 4.3	30.1	1.5	4-3+2+4+ 6o4+5o5o	34o	28
8	3.2 2.4 2.9 4.6 4.1 4.6 4.5 4.4	30.7	1.4	4-3o4-6- 5-5+5o5-	36-	
9	3.7 3.3 3.1 3.3 3.1 3.4 3.7 4.7	28.3	1.1	4+4o4o4- 3+4-4o6o	33o	
10	4.5 4.6 4.2 3.0 4.1 3.4 3.9 3.6	31.3	1.3	5o6-5o3+ 4+4-4o4o	35o	
11	3.7 3.0 3.6 2.9 2.8 4.3 4.5 2.6	27.4	1.2	4o4-4+3+ 3o5o5-3-	31-	Five
12	3.7 3.4 3.3 4.1 4.1 3.1 3.7 2.3	27.7	1.2	4+4+4o5o 5-4-4o2o	32o	Dist.
13	2.4 2.6 2.6 4.1 4.3 4.8 5.8 5.4	32.0	1.6	3o3+3+5- 5o6-7-6+	38o	
14	4.0 3.9 3.8 3.3 4.1 3.9 5.2 3.4	31.6	1.4	5o5-5-3+ 5-5-6+4-	37o	7
15	4.9 3.5 2.6 2.4 2.2 2.0 1.6 1.0	20.2	1.0	6o4o3o2+ 2+2o2-1-	22o	10
						13
16	0.9 2.4 2.6 3.7 3.1 3.1 3.6 2.9	22.3	1.0	1-3o3o4+ 3+3o4-3o	24o	14
17	2.1 1.5 4.1 4.4 2.9 3.3 2.4 2.8	23.5	0.9	2o2-5+5+ 3o4-3-3-	26+	22
18	2.7 2.8 2.8 4.1 2.7 2.7 2.9 3.3	24.0	0.9	3o3+3+5+ 3o3o3-4o	28-	
19	3.0 2.4 2.9 2.1 1.2 1.6 1.6 1.2	16.0	0.5	3+3o4-2o 1-2-2-1+	17+	
20	0.7 0.9 1.1 3.6 3.5 2.4 1.4 0.9	14.5	0.7	1-1o1o4o 4o3-1o1-	15o	
						Ten
21	0.7 0.6 1.7 1.5 1.5 1.2 2.1 3.1	12.4	0.4	1-1o2o2- 1+1o2o4-	13+	Quiet
22	3.3 2.9 2.4 3.9 4.0 5.2 4.9 4.7	31.3	1.5	4o4-3o5- 5-6-6o6-	37+	
23	3.7 3.3 2.8 3.3 3.4 3.4 4.3 3.9	28.1	1.1	4o4o3+4- 4o4o5o4+	32+	2
24	3.3 2.4 2.3 3.0 3.3 3.2 4.2 3.7	25.4	1.0	4-3o3-3+ 4-3+4+4o	28o	3
25	3.2 3.9 1.6 3.5 2.9 2.4 1.7 2.9	22.1	0.9	4-5-2-4+ 3+3-1+3o	25-	4
						5
26	3.1 2.3 2.6 2.8 2.9 2.3 3.5 3.5	23.0	0.9	3+3-3+3+ 3o2+4-4-	25+	19
27	2.9 3.7 2.3 2.3 1.8 2.3 1.8 2.2	19.3	0.6	3+5-3o3- 2+2+2-2o	22o	20
28	1.9 0.6 0.5 0.6 1.4 1.3 1.1 1.6	9.0	0.1	2+1-0+0o 1o1+1o1+	8o	21
29	0.8 3.4 4.1 3.5 4.2 3.8 3.6 3.9	27.3	1.2	2-4+5+4o 5-4o4o4+	31+	28
30	3.5 2.0 1.7 2.5 2.6 1.7 1.5 1.8	17.3	0.7	4-3-2o3- 3-1+1o2-	18-	30
31	1.0 1.2 2.5 1.6 2.0 3.0 2.6 1.6	15.5	0.6	1+2-3o2+ 2-3+2+1+	17o	31
Mean	2.51 2.63 2.95 2.94 2.51 2.94 2.87 2.80	22.15	0.90			

Table 66

Sudden Ionosphere Disturbances Observed at Washington, D. C.

April 1951

1951 Day	GCT Beginning	GCT End	Location of transmitters	Relative intensity at minimum*	Other phenomena
April					
2	1710	1820	Ohio, D. C., Colombia, England, New Brunswick	0.0	Solar flare*** 1706
10	1714	1820	Ohio, D. C., Colombia, England, New Brunswick	0.05	
12	2014	2110	Ohio, D. C., Colombia, England	0.01	Solar flare*** 2010
13	1558	1625	Ohio, D. C.	0.1	Solar flare*** 1535 Solar flare**** 1600
17	1420	1500	Ohio, D. C., England	0.2	Terr.mag.pulse** 1405-1410
17	1721	1735	Ohio, D. C., Colombia	0.1	
17	1800	1940	Ohio, D. C., Colombia, England	0.0	
17	2015	2040	Ohio, D. C., Colombia	0.05	Solar flare*** 2015
18	1625	1650	Ohio, D. C.	0.2	Solar flare*** 1630
18	1808	1830	Ohio, D. C.	0.2	
18	2045	2145	Ohio, D. C., Colombia, England	0.0	Solar flare*** 2045
19	1507	1740	Ohio, D. C., Colombia, England	0.0	Solar flare*** 1534
20-21	2222	0000	Ohio, D. C., England	0.0	
23	1345	1410	Ohio, D. C., Colombia, England	0.2	
23	1659	1800	Ohio, D. C., Colombia, England, New Brunswick	0.2	Solar flare*** 1700
24	1815	1920	Ohio, D. C., Colombia, England, New Brunswick	0.0	
30	1720	1745	Ohio, D. C., Colombia, England, New Brunswick	0.0	Terr.mag.pulse** 1720-1740

*Ratio of received field intensity during SID to average field intensity before and after, for station KQ2XAU (formerly W8XAL), 6080 kilocycles, 600 kilometers distant for all SID except the following: Station GLH, 13525 kilocycles, received in New York, 5340 kilometers distant was used for the SID on April 12.

**As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.

***Time of observation at Sacramento Peak, New Mexico.

****Time of observation at Wendelstein Observatory, Germany.

Table 67

Sudden Ionosphere Disturbances Reported by Engineer-in-Chief,

Cable and Wireless, Ltd., as Observed in England

1951 Day	GCT Beginning	GCT End	Receiving station	Location of transmitters	Other phenomena
March					
24	1137	1155	Brentwood	Bahrein I., Greece, Iran, Palestine, Spain, U.S.S.R.	Solar flare* 1135
24	1137	1200	Somerton	Argentina, Australia, Ceylon, China, Egypt, Gold Coast, India, Union of S. Africa	Solar flare* 1135
April					
12	0745	0850	Brentwood	Austria, Bahrein I., Barbados, Belgian Congo, French Equatorial Africa, India, Iran, Palestine, Syria, Thailand, Turkey, U.S.S.R.	Solar flare** 0736
12	0745	0845	Somerton	Ascension I., Ceylon, China, Cyprus, Egypt, India, Union of S. Africa	Solar flare** 0736
15	0913	0945	Brentwood	Austria, Bulgaria, Eritrea, India, Iran, Madagascar, Palestine, Spain, Syria, Switzerland, Trans-Jordan, U.S.S.R.	
15	0915	1005	Somerton	Aden, Ascension I., Australia, Ceylon, China, Cyprus	
19	0530	0730	Brentwood	Bahrein I., Bulgaria, Eritrea, India, Iran, Kenya, Palestine, Southern Rhodesia, Syria, Trans-Jordan, U.S.S.R.	
19	0535	0730	Somerton	Aden, Ceylon, Cyprus, India	
19	1515	1715	Brentwood	Barbados, Chile, Colombia, Uruguay, Venezuela	Solar flare*** 1534
19	1530	1650	Somerton	Argentina, Brazil, Canada, New York	Solar flare*** 1534
30	0642	0710	Brentwood	Bahrein I., Bulgaria, India, Iran, Southern Rhodesia, Switzerland, Syria	
30	1735	1750	Brentwood	Barbados, Chile, Colombia, Uruguay, Venezuela	Terr.mag.pulse**** 1720-1740
30	1725	1740	Somerton	Argentina, Brazil, New York	Terr.mag.pulse**** 1720-1740

*Time of observation at Edinburgh Observatory, Scotland.
**Time of observation at Schauinsland Observatory, Germany.
***Time of observation at Sacramento Peak, New Mexico.
****As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.

Table 68

Sudden Ionosphere Disturbances Reported by RCA Communications, Inc.

as Observed at Point Reyes, California

1951 Day	GCT Beginning	GCT End	Location of transmitters	Other phenomena
April 12	2018	2110	Australia, Hawaii, Japan, Philippine Is.	Solar flare* 2010
17	2320	2355	Australia, China, French Indo-China, Hawaii, Japan, Java, Korea, Okinawa, Philippine Is.	Solar flare* 2320
18	2057	2245	Australia, China, Hawaii, Japan, Philippine Is.	Solar flares* 2045 and 2100
18-19	2350	0055	Australia, China, French Indo-China, Hawaii, Japan, Java, Korea, New Zealand, Okinawa, Philippine Is.	Solar flare* 2340 Terr.mag.pulse** 2358-0025
20	0050	0130	Australia, China, Hawaii, Japan, Java, Korea, Philippine Is.	
20-21	2230	0050	Australia, China, Hawaii, Japan, Philippine Is.	
30	1724	1745	Australia, China, Hawaii, Japan, Philippine Is.	Terr.mag.pulse** 1720-1740

*Time of observation at Sacramento Peak, New Mexico.
**As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.

Table 69

Sudden Ionosphere Disturbances Reported by RCA Communications, Inc.,

as Observed at Riverhead, New York

1951 Day	GCT Beginning	GCT End	Location of transmitters	Other phenomena
April 12	2014	2115	Argentina, Canada, England, Italy, Panama	Solar flare* 2010
25	0850	1000	England, Italy, Tangier	Solar flare** 0850
30	1722	1740	Argentina, California, Canada, England, Italy, Panama, Switzerland, Tangier	Terr.mag.pulse*** 1720-1740

*Time of observation at Sacramento Peak, New Mexico
**Time of observation at Wendelstein Observatory, Germany.
***As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.

Table 70

Sudden Ionosphere Disturbances Reported by Engineer-in-Chief,

Cable and Wireless, Ltd., as Observed at Hong Kong, China

1951 Day	GCT Beginning	GCT End	Location of transmitters
February 26	0205	0230	Australia, China, French Indo-China, Japan, Korea, Philippine Is., Thailand

Note: Observers are invited to send to the CRPL information on times of beginning and end of sudden ionosphere disturbances for publication as above. Address letters to the Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

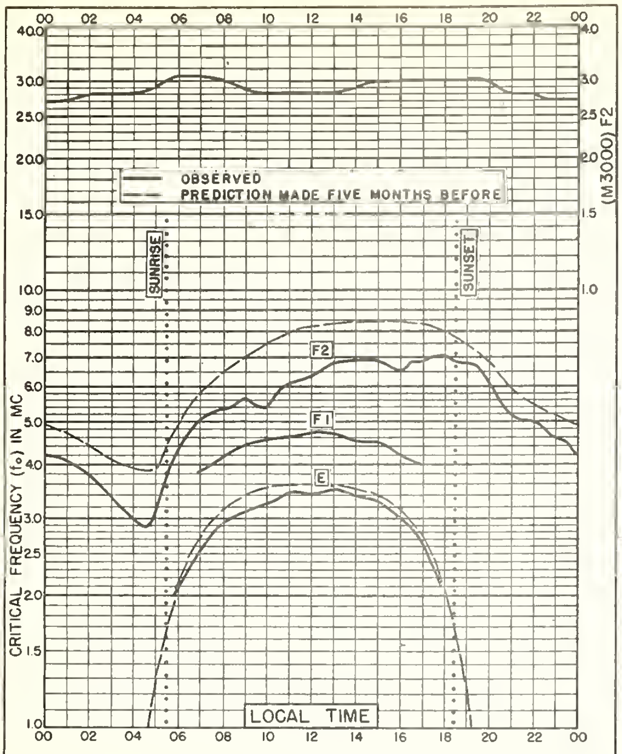


Fig. 1. WASHINGTON, D. C.
38.7°N, 77.1°W APRIL 1951

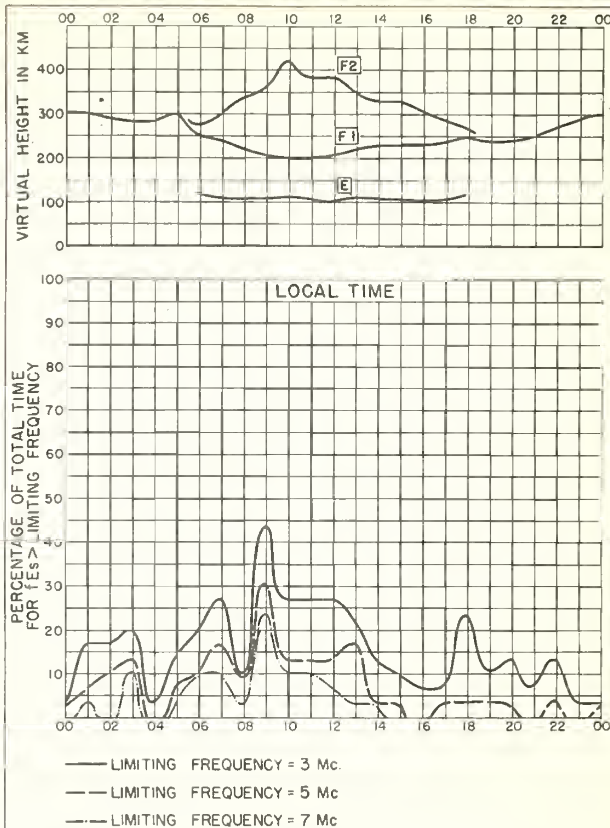


Fig. 2. WASHINGTON, D. C. APRIL 1951

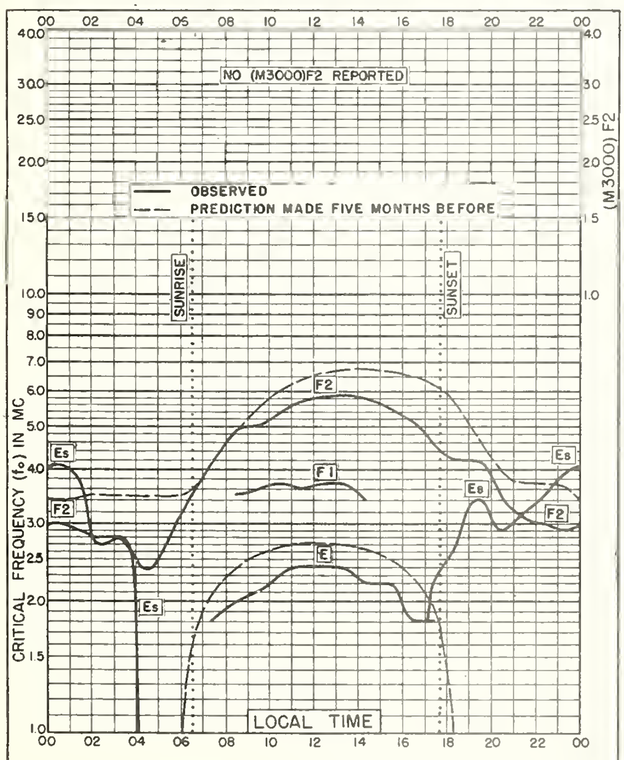


Fig. 3. KIRUNA, SWEDEN
67.8°N, 20.5°E MARCH 1951

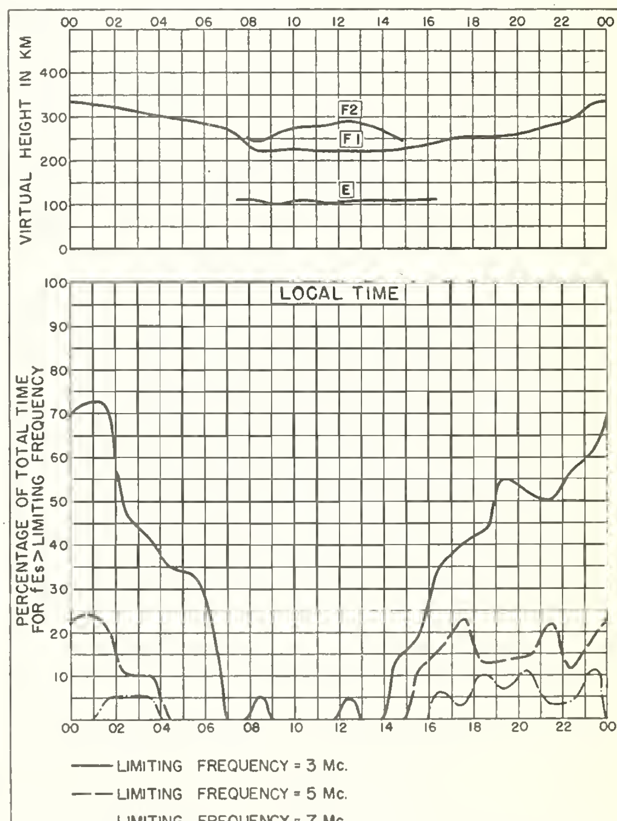


Fig. 4. KIRUNA, SWEDEN MARCH 1951

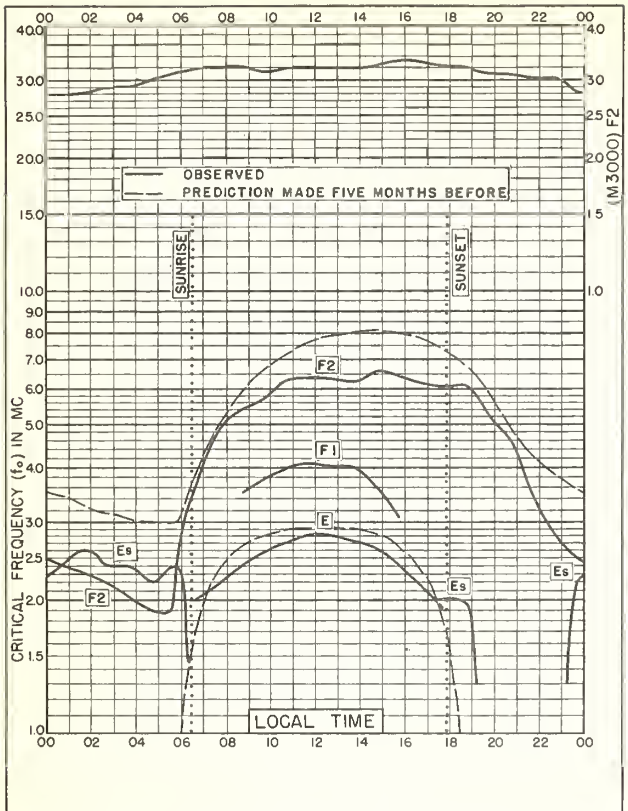


Fig. 5. OSLO, NORWAY
60.0°N, 11.0°E MARCH 1951

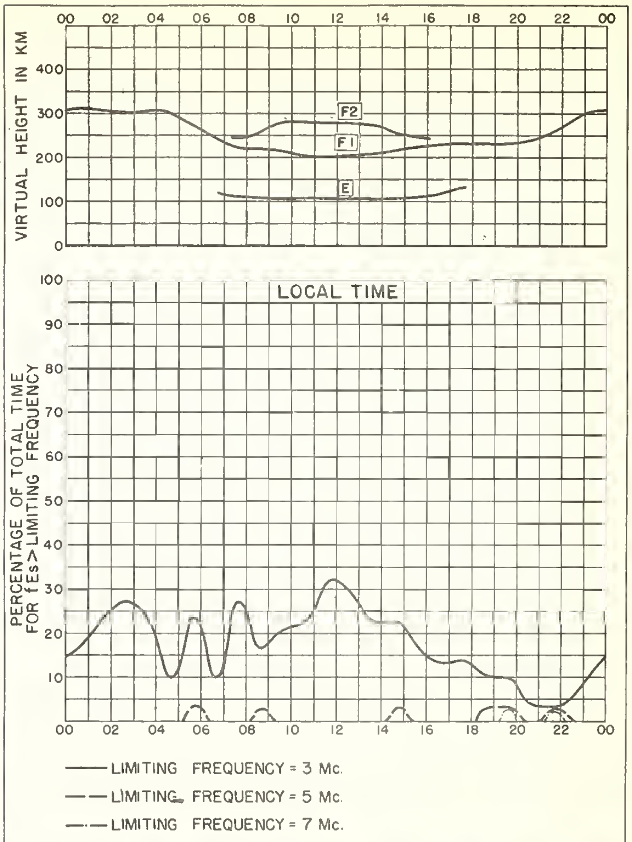


Fig. 6. OSLO, NORWAY MARCH 1951

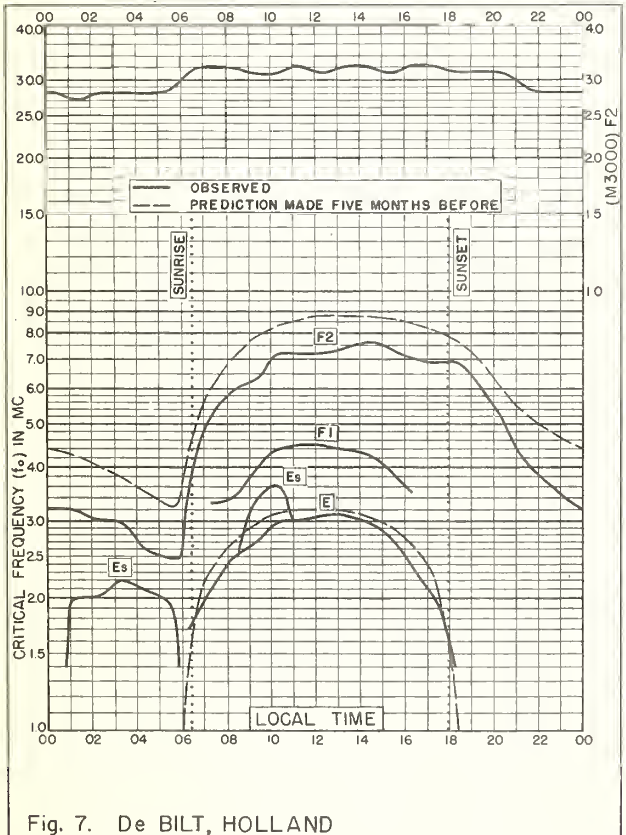


Fig. 7. De BILT, HOLLAND
52.1°N, 5.2°E MARCH 1951

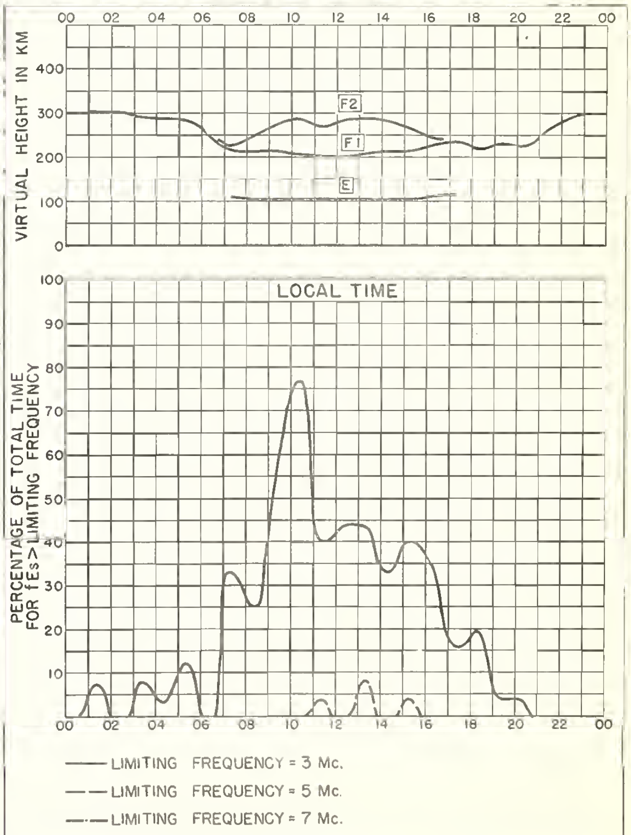


Fig. 8. De BILT, HOLLAND MARCH 1951

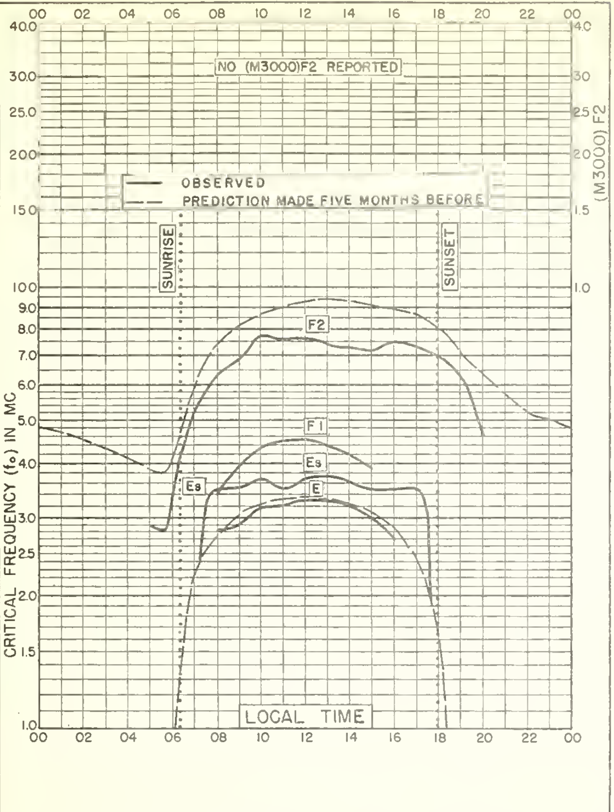


Fig. 9. GRAZ, AUSTRIA
47.1°N, 15.5°E MARCH 1951

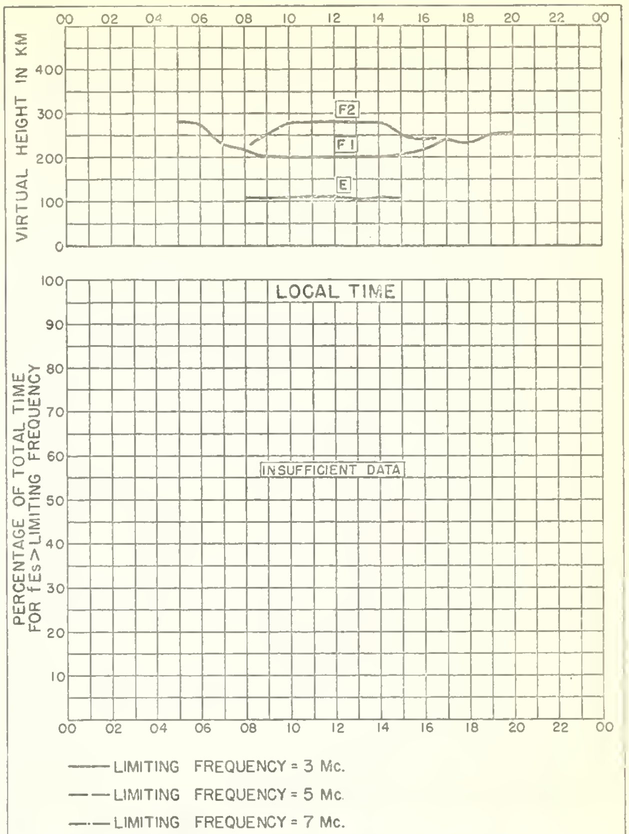


Fig. 10. GRAZ, AUSTRIA MARCH 1951

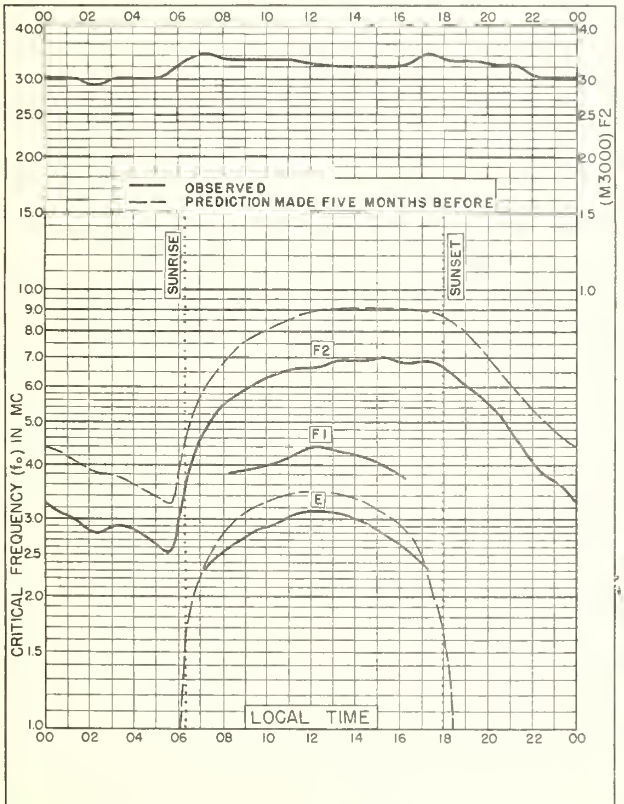


Fig. 11. BOSTON, MASSACHUSETTS
42.4°N, 71.2°W MARCH 1951

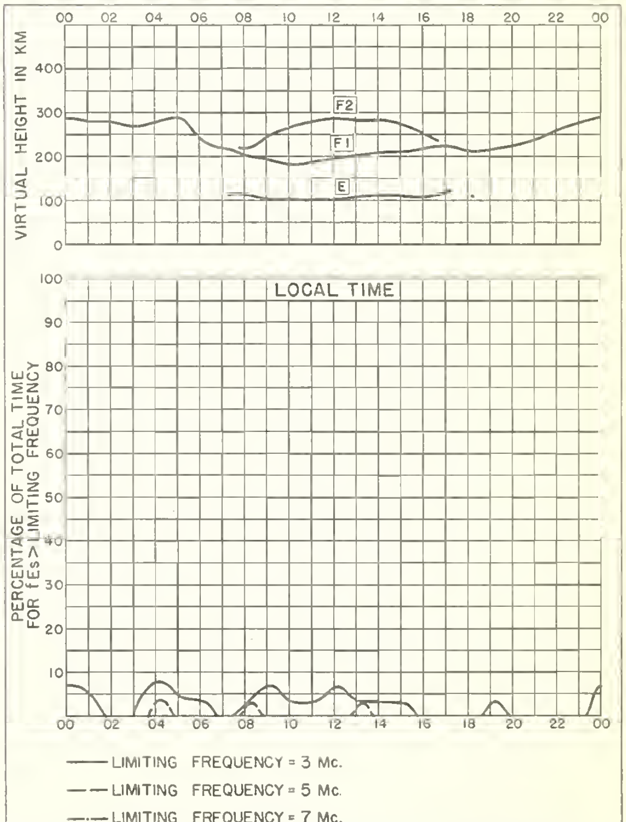


Fig. 12. BOSTON, MASSACHUSETTS MARCH 1951

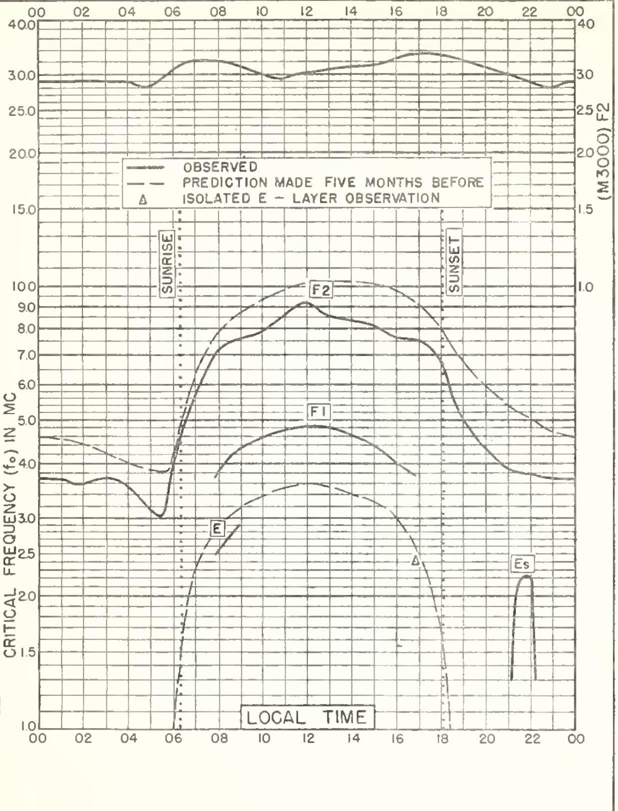


Fig. 13. SAN FRANCISCO, CALIFORNIA
37.4°N, 122.2°W MARCH 1951

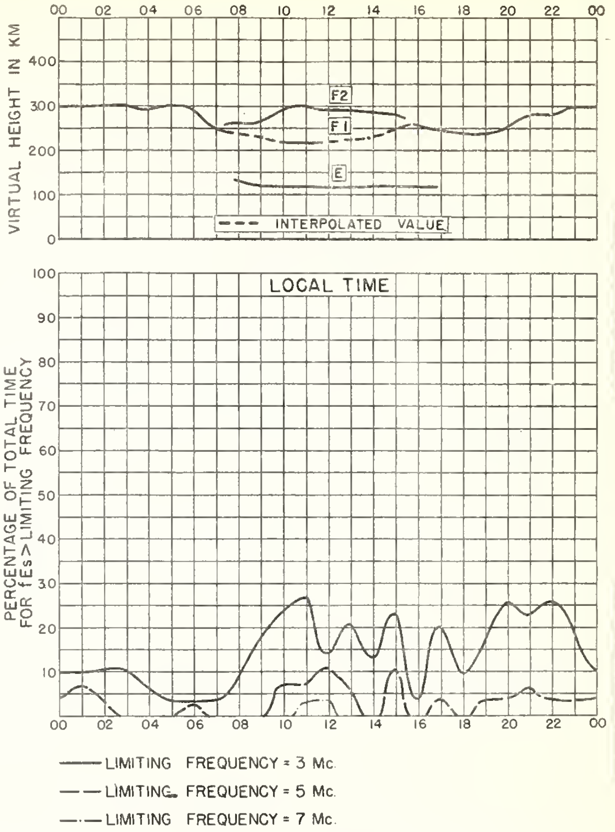


Fig. 14. SAN FRANCISCO, CALIFORNIA MARCH 1951

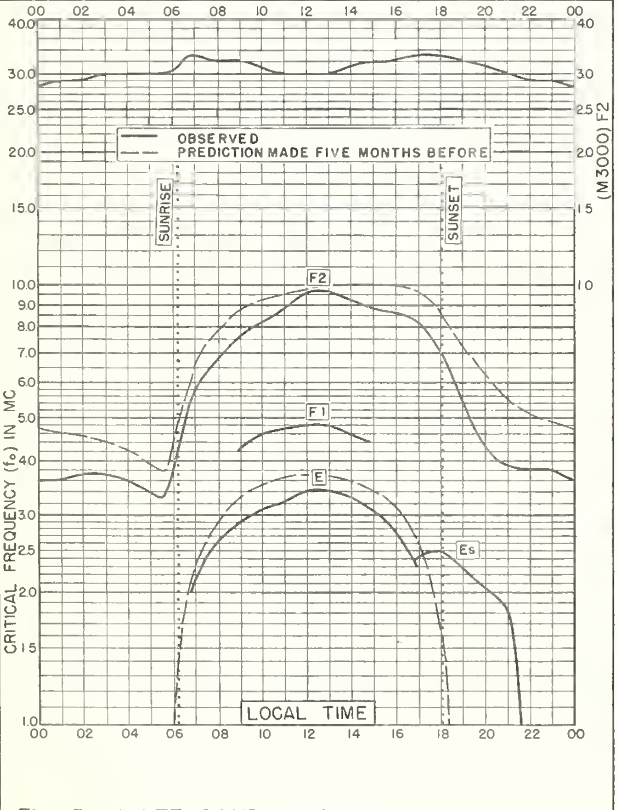


Fig. 15. WHITE SANDS, NEW MEXICO
32.3°N, 106.5°W MARCH 1951

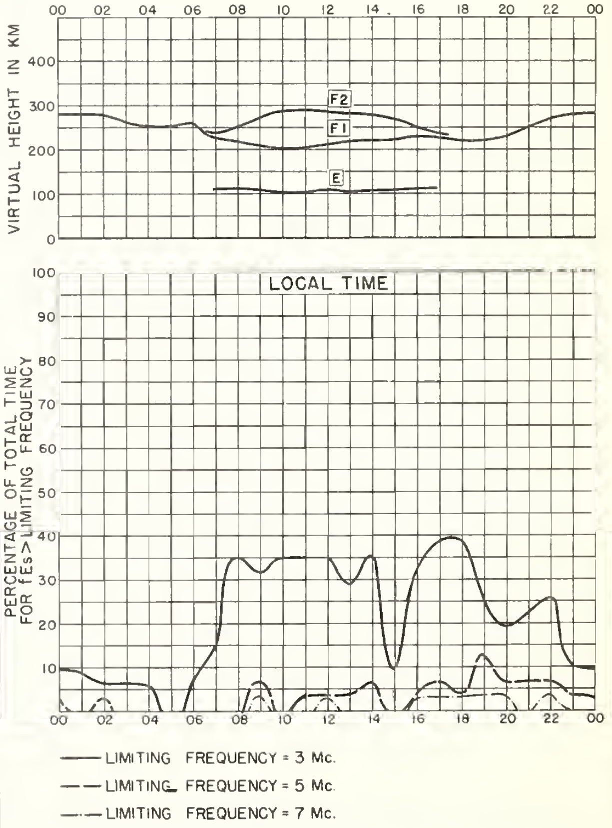


Fig. 16. WHITE SANDS, NEW MEXICO MARCH 1951

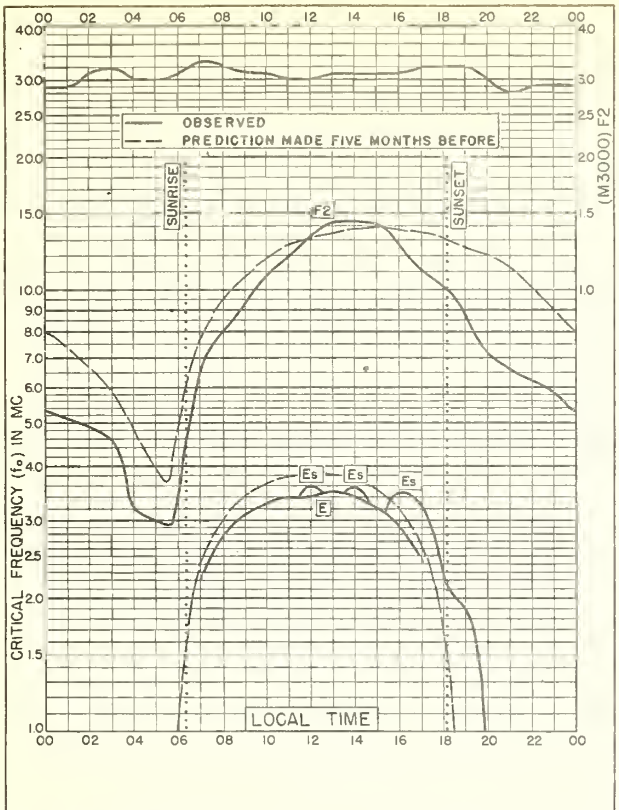


Fig. 17. OKINAWA I.
26.3°N, 127. 8°E MARCH 1951

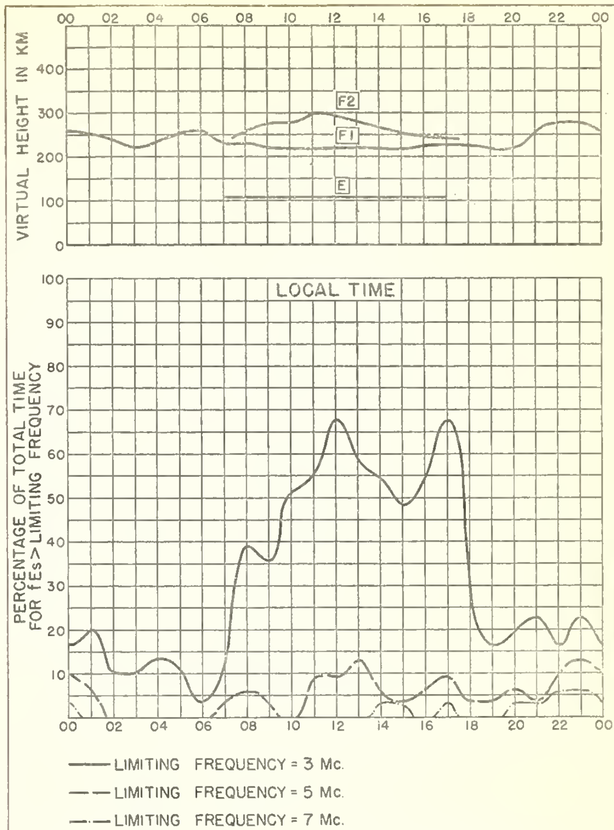


Fig. 18. OKINAWA I. MARCH 1951

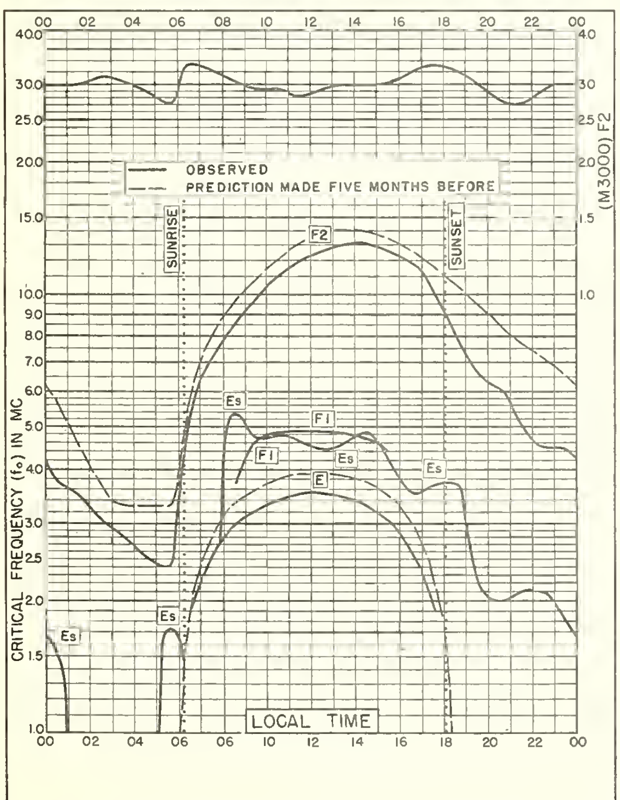


Fig. 19. MAUI, HAWAII
20.8°N, 156.5°W MARCH 1951

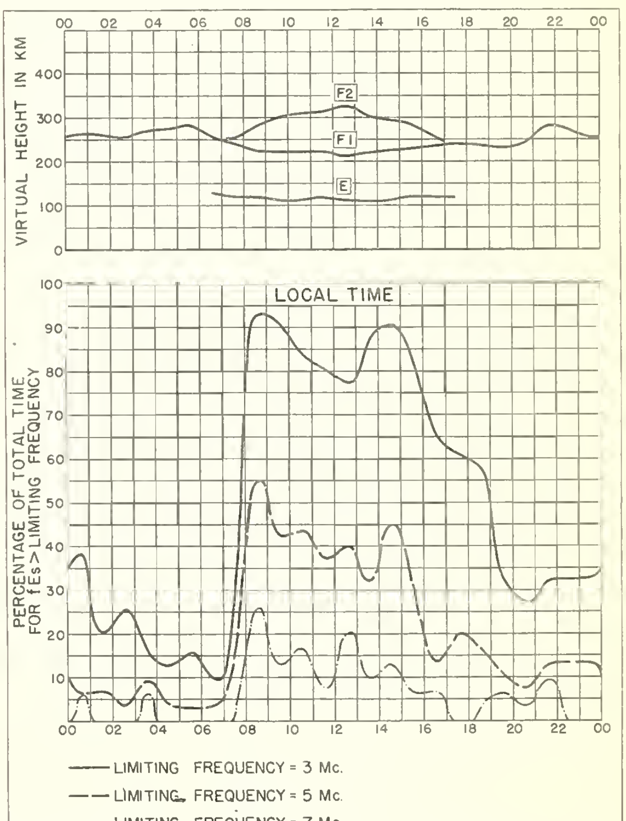


Fig. 20. MAUI, HAWAII MARCH 1951

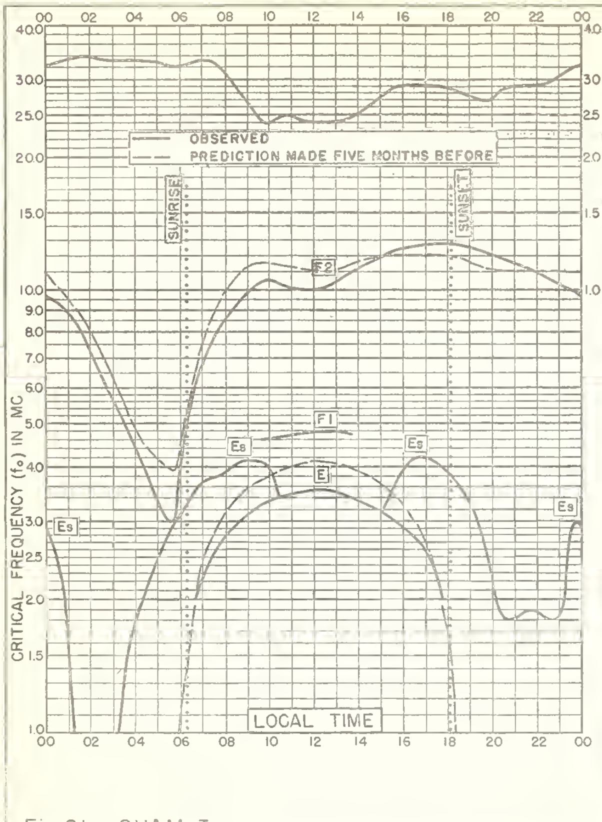


Fig. 21. GUAM I.
13.6°N, 144.9°E MARCH 1951

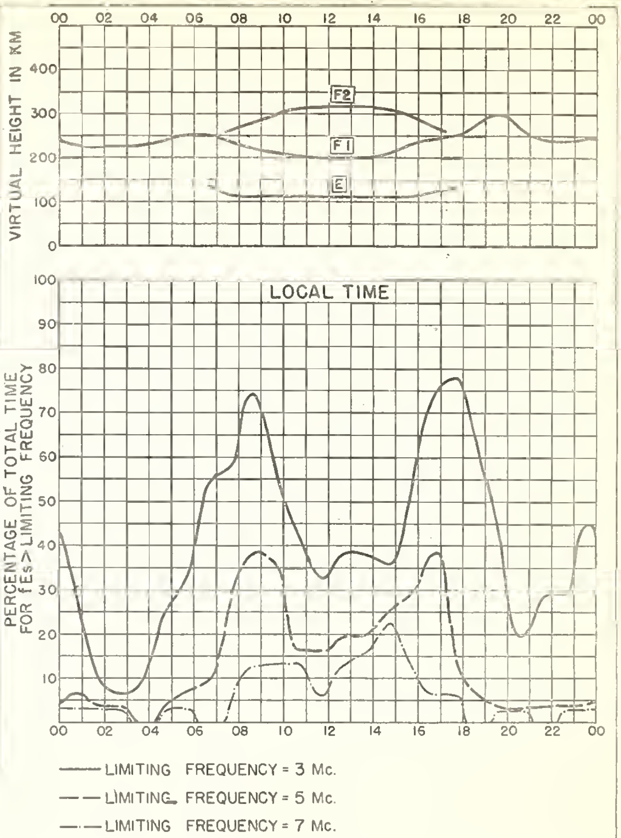


Fig. 22. GUAM I. MARCH 1951

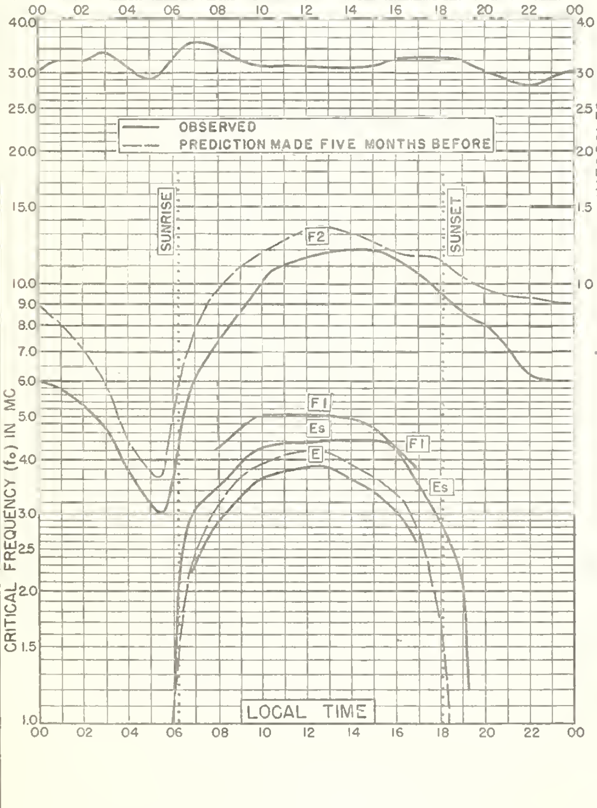


Fig. 23. TRINIDAD, BRIT. W. INDIES
10.7°N, 61.6°W MARCH 1951

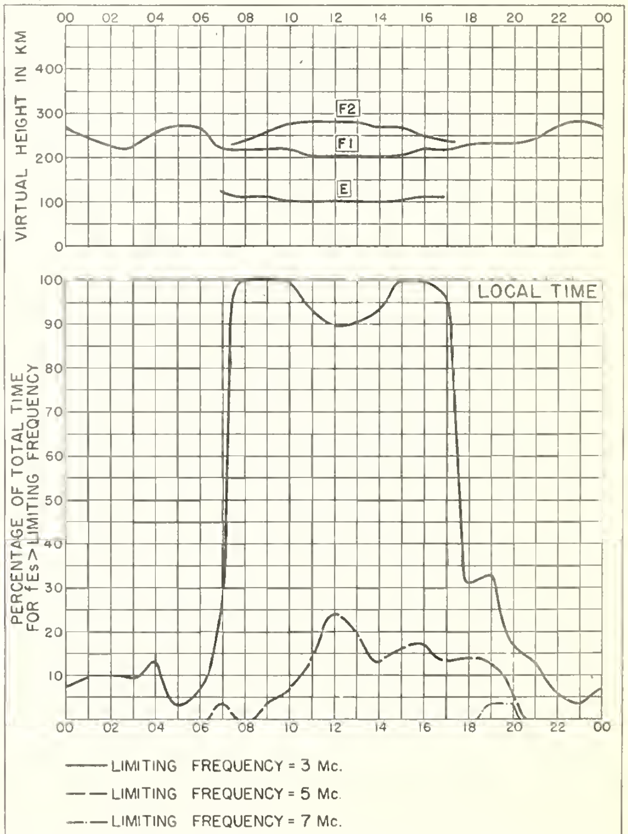


Fig. 24. TRINIDAD, BRIT. W. INDIES MARCH 1951

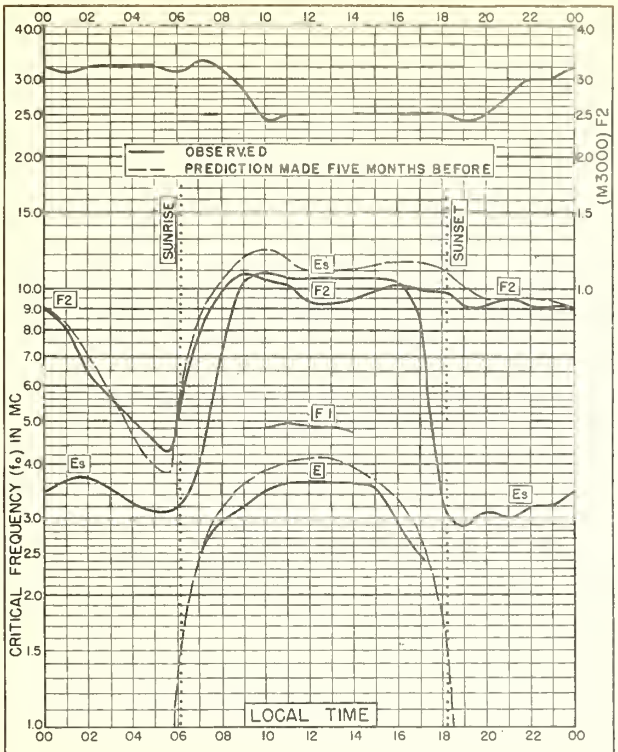


Fig. 25. HUANCAYO, PERU
12.0°S, 75.3°W MARCH 1951

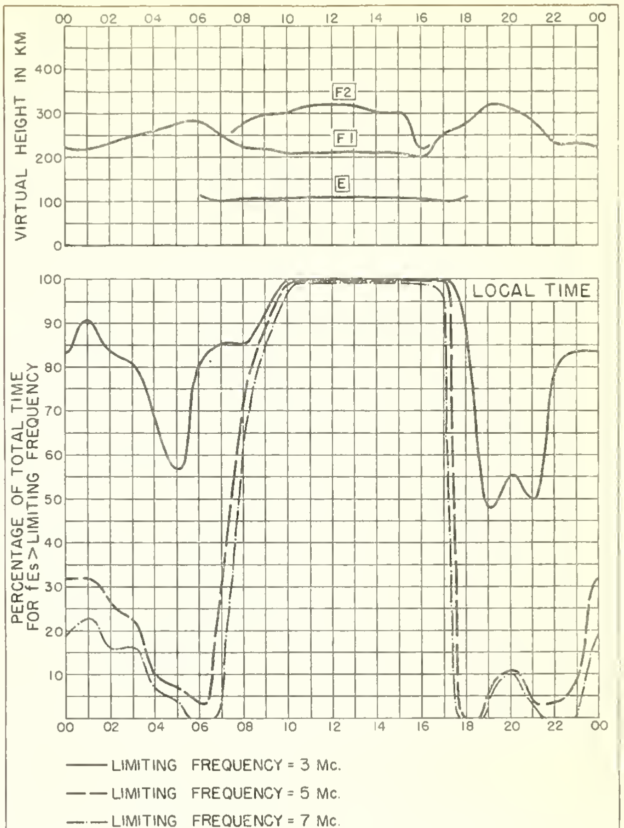


Fig. 26. HUANCAYO, PERU MARCH 1951

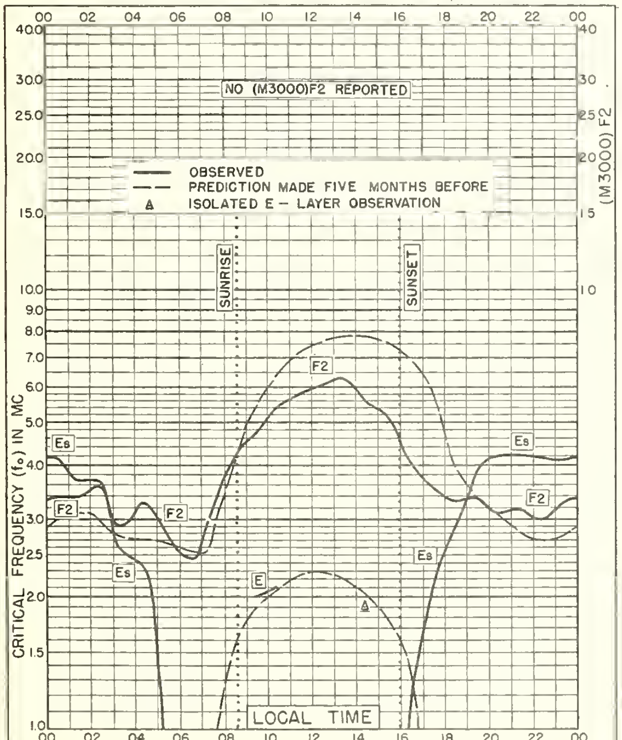


Fig. 27. KIRUNA, SWEDEN
67.8°N, 20.5°E FEBRUARY 1951

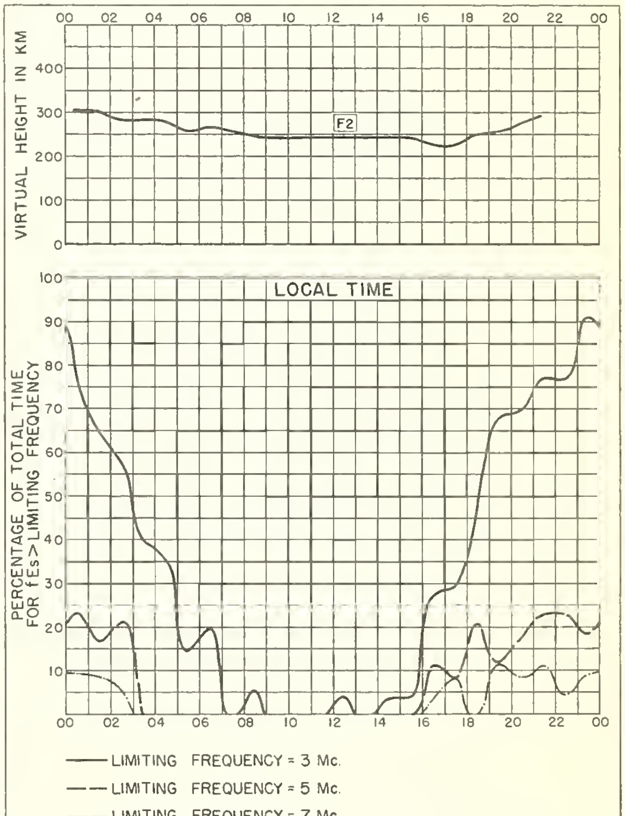


Fig. 28. KIRUNA, SWEDEN FEBRUARY 1951

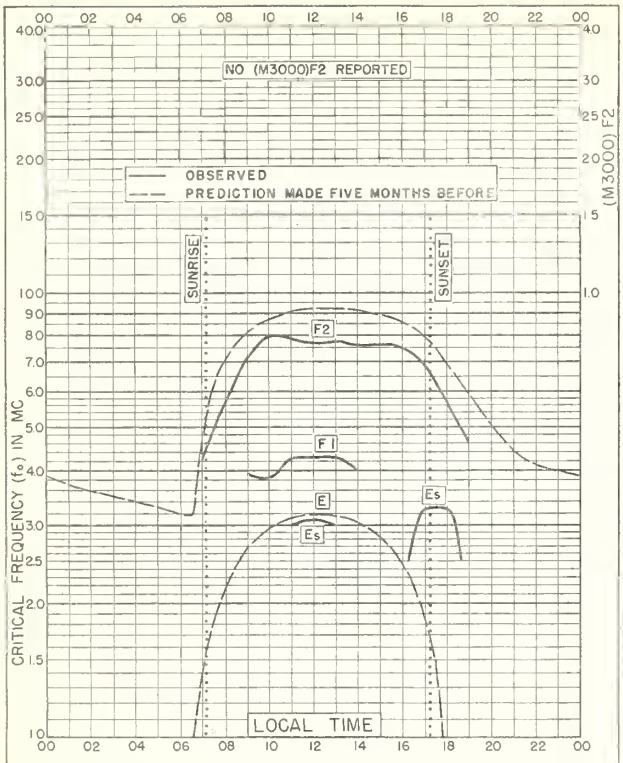


Fig. 29. GRAZ, AUSTRIA
47.1°N, 15.5°E FEBRUARY 1951

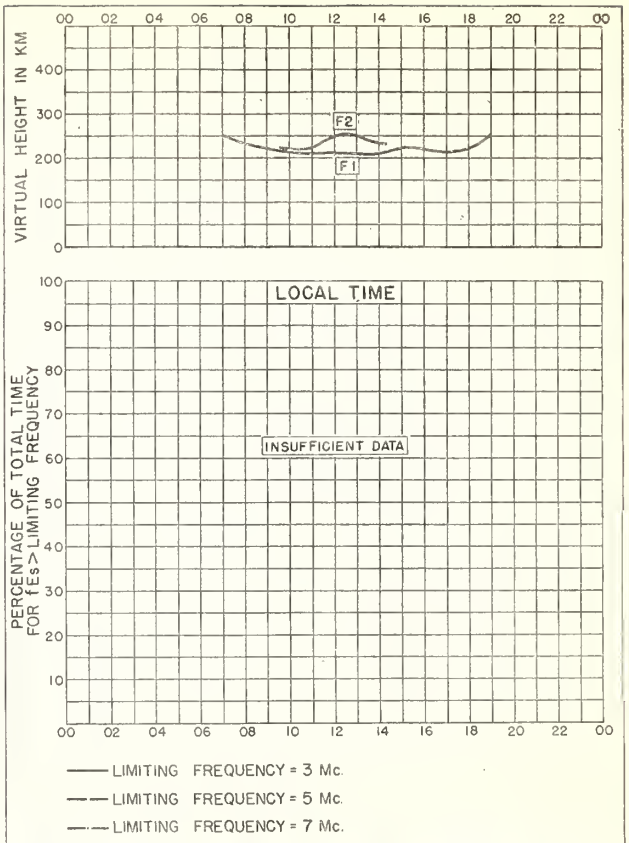


Fig. 30. GRAZ, AUSTRIA FEBRUARY 1951

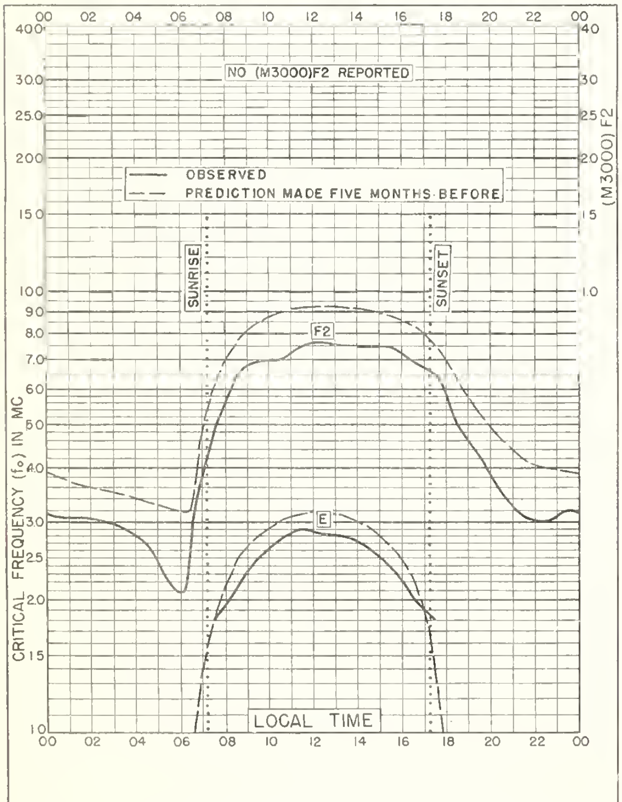


Fig. 31. SCHWARZENBURG, SWITZERLAND
46.8°N, 7.3°E FEBRUARY 1951

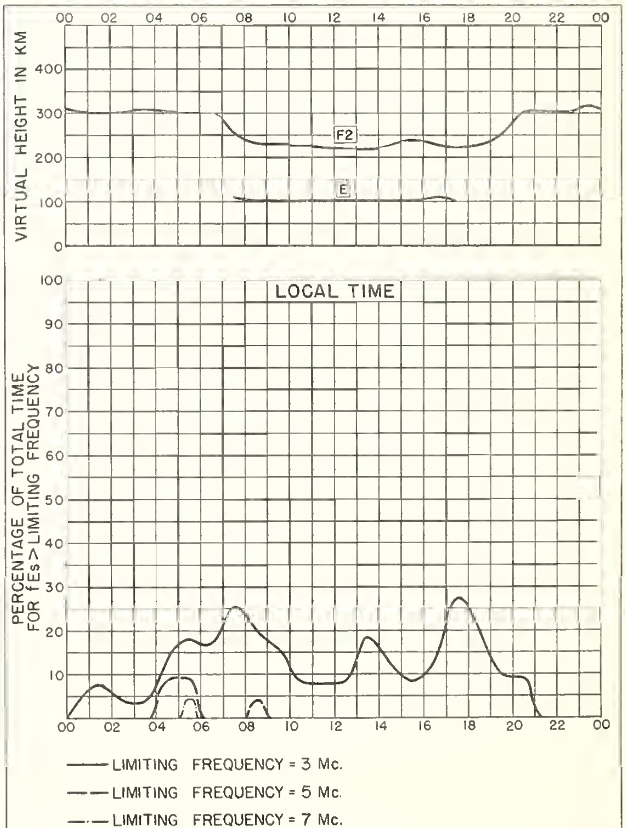


Fig. 32. SCHWARZENBURG, SWITZERLAND FEBRUARY 1951

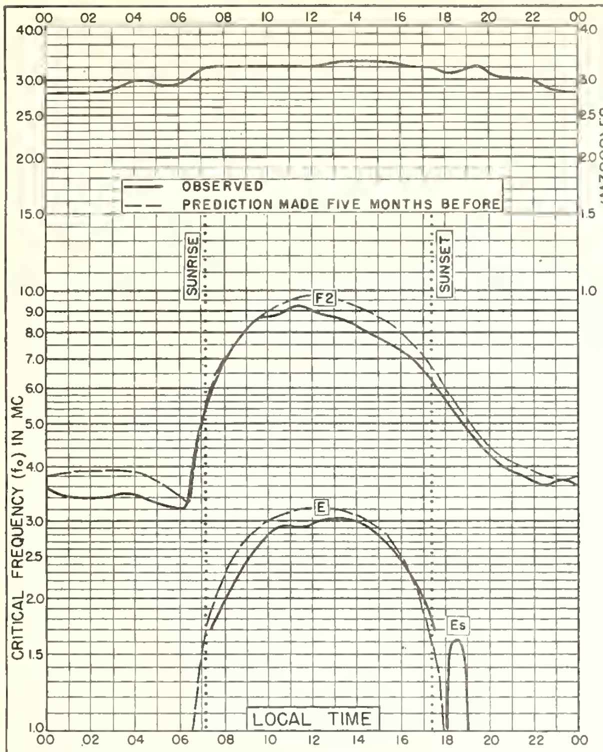


Fig. 33. WAKKANAI, JAPAN
45.4°N, 141.7°E FEBRUARY 1951

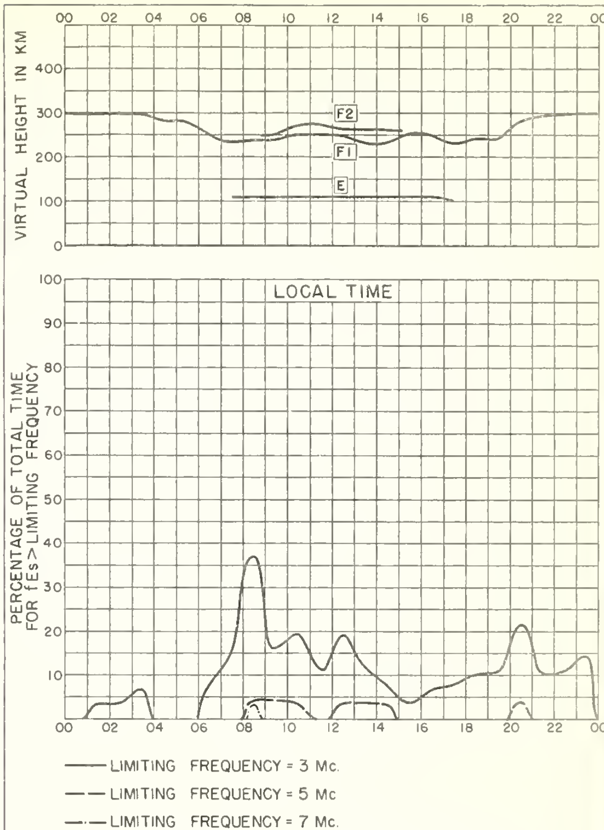


Fig. 34. WAKKANAI, JAPAN FEBRUARY 1951

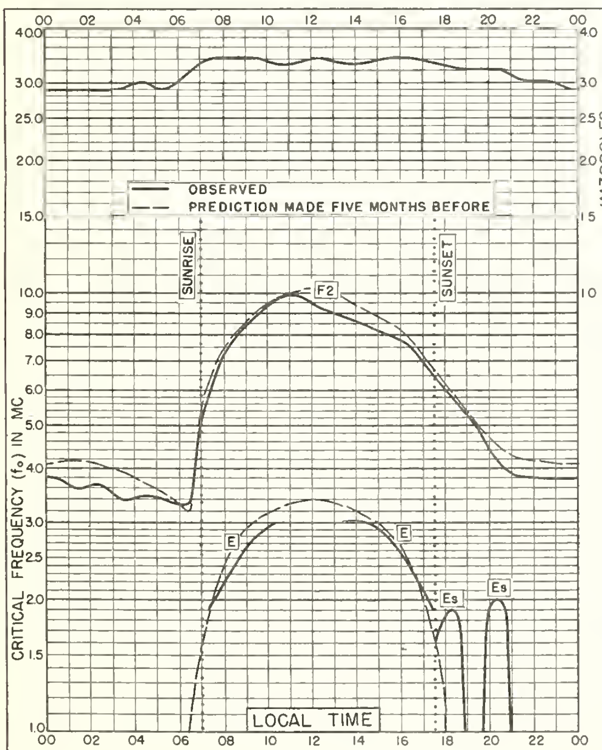


Fig. 35. AKITA, JAPAN
39. 7°N, 140. 1°E FEBRUARY 1951

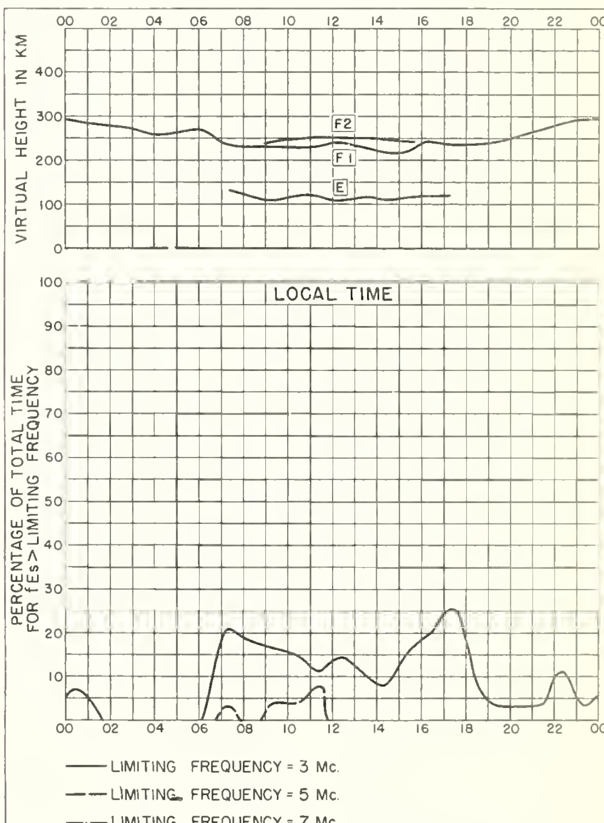


Fig. 36. AKITA, JAPAN FEBRUARY 1951

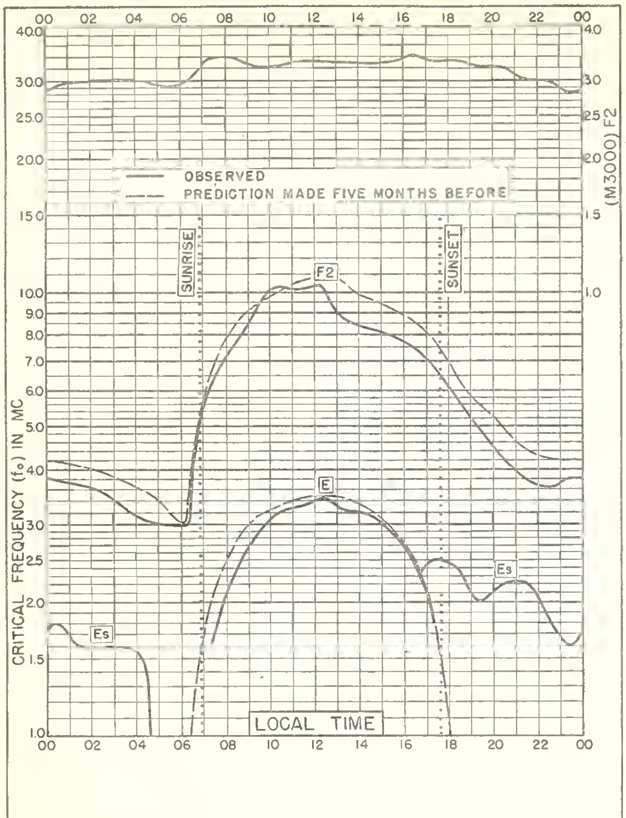


Fig. 37. TOKYO, JAPAN
35. 7°N, 139.5°E FEBRUARY 1951

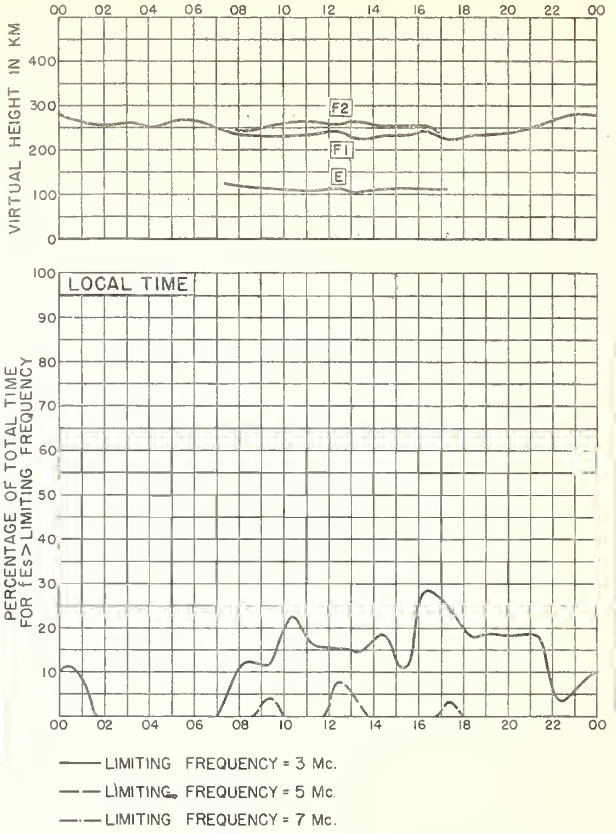


Fig. 38. TOKYO, JAPAN FEBRUARY 1951

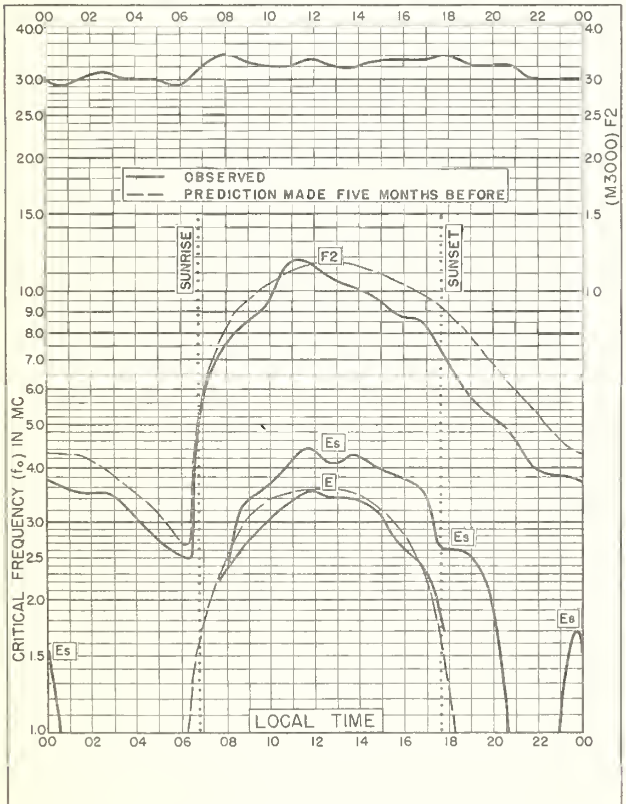


Fig. 39. YAMAGAWA, JAPAN
31. 2°N, 130. 6°E FEBRUARY 1951

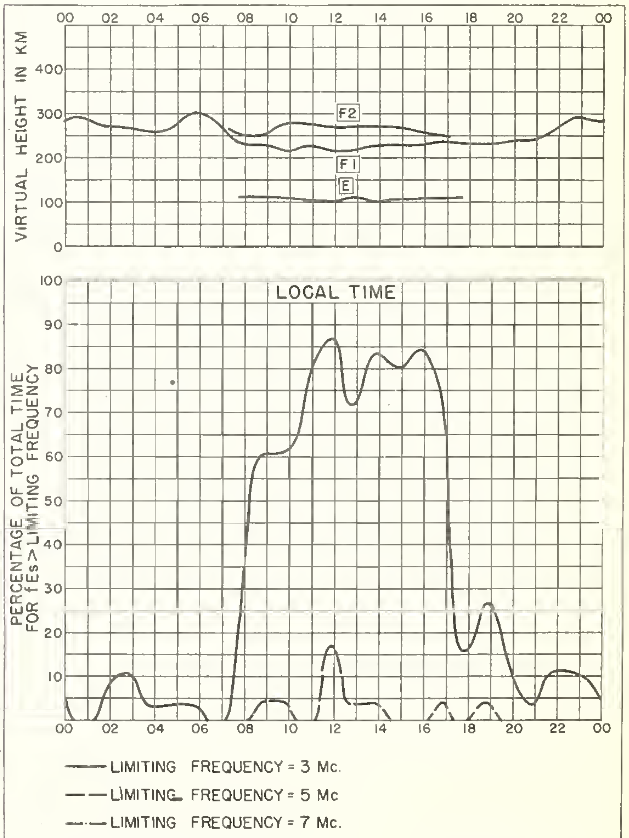


Fig. 40. YAMAGAWA, JAPAN FEBRUARY 1951

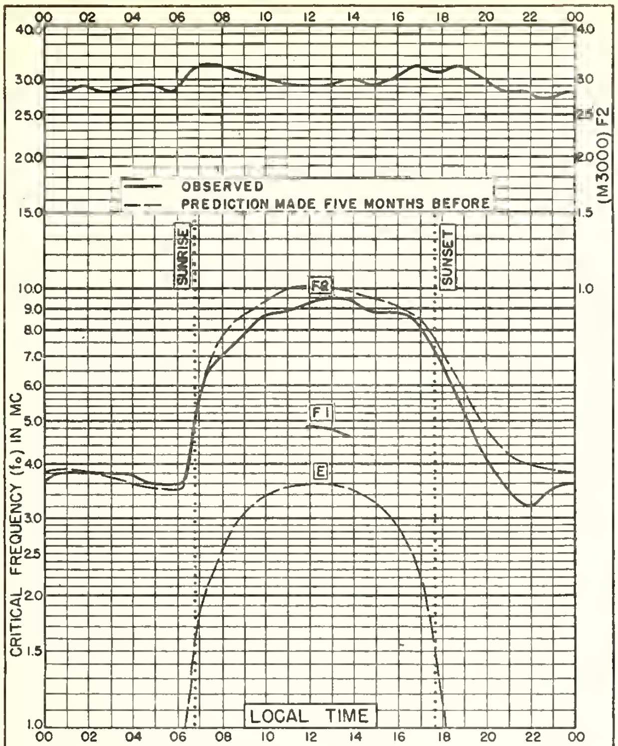


Fig. 41. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W FEBRUARY 1951

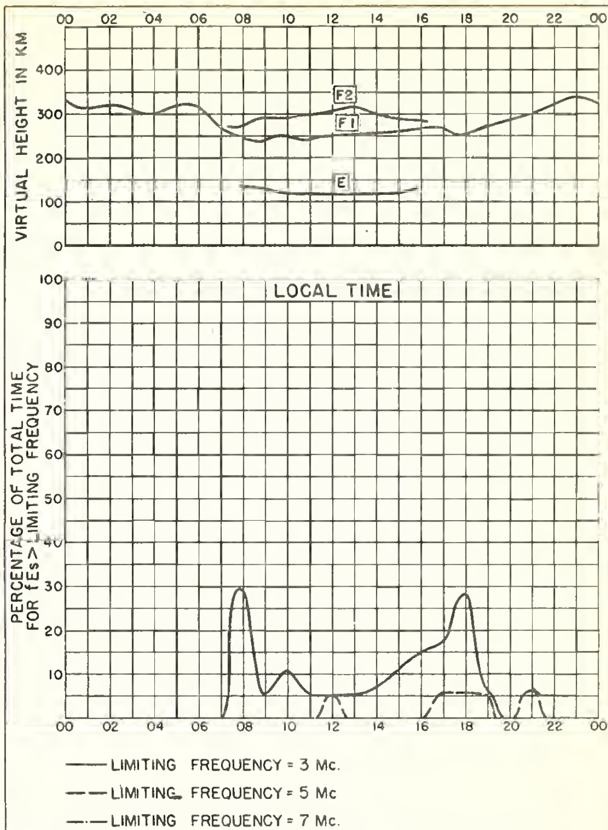


Fig. 42. BATON ROUGE, LOUISIANA FEBRUARY 1951

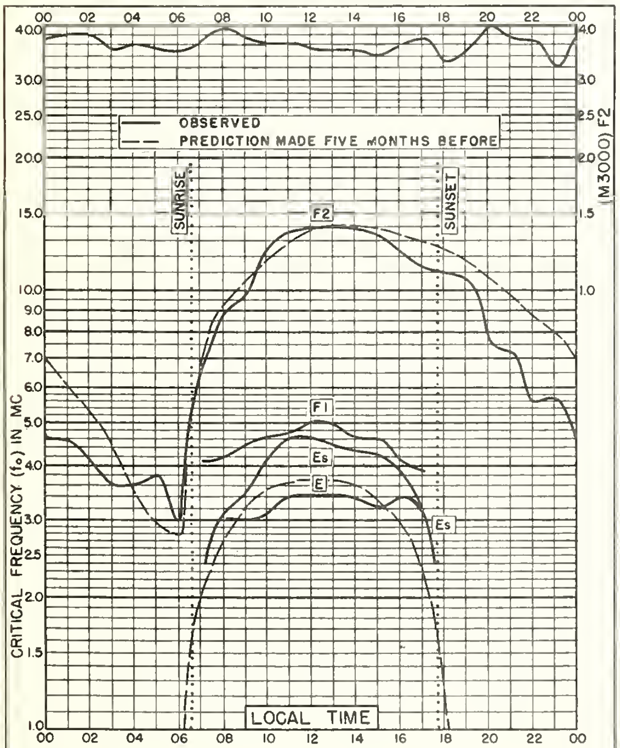


Fig. 43. FORMOSA, CHINA
25.0°N, 121.0°E FEBRUARY 1951

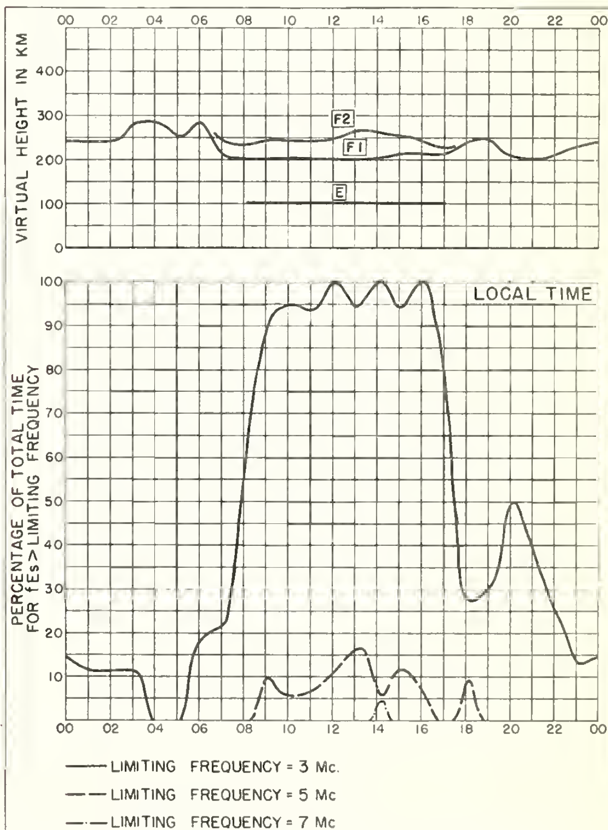


Fig. 44. FORMOSA, CHINA FEBRUARY 1951

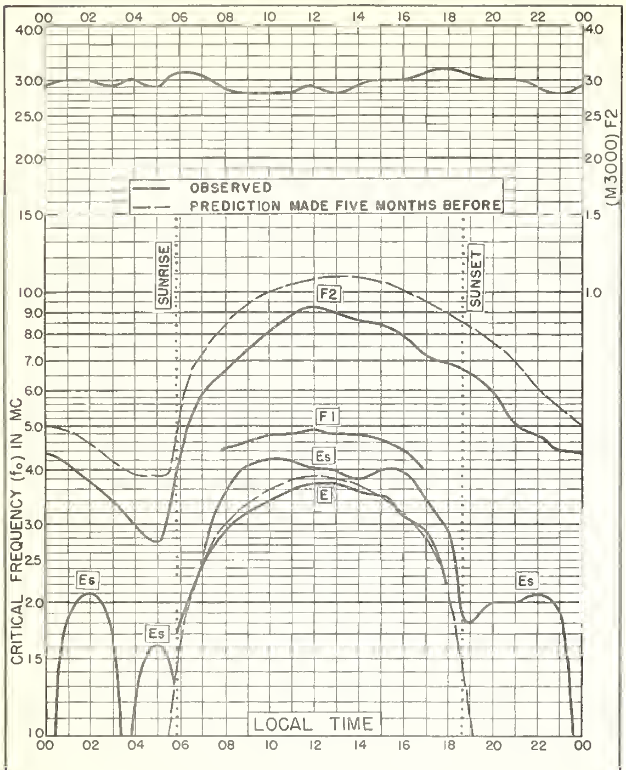


Fig. 45. JOHANNESBURG, U. OF S. AFRICA
26.2°S, 28.1°E FEBRUARY 1951

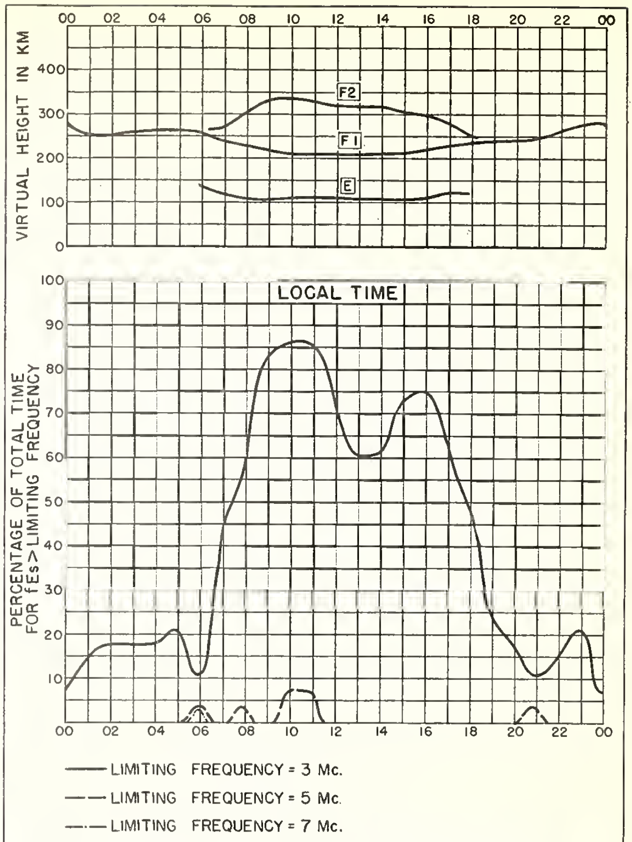


Fig. 46. JOHANNESBURG, U. OF S. AFRICA FEBRUARY 1951

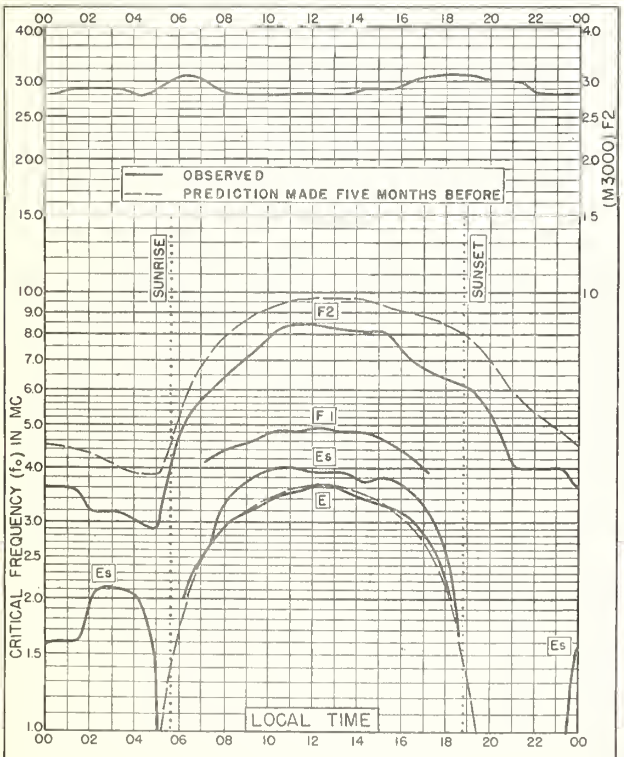


Fig. 47. CAPETOWN, U. OF S. AFRICA
34.2°S, 18.3°E FEBRUARY 1951

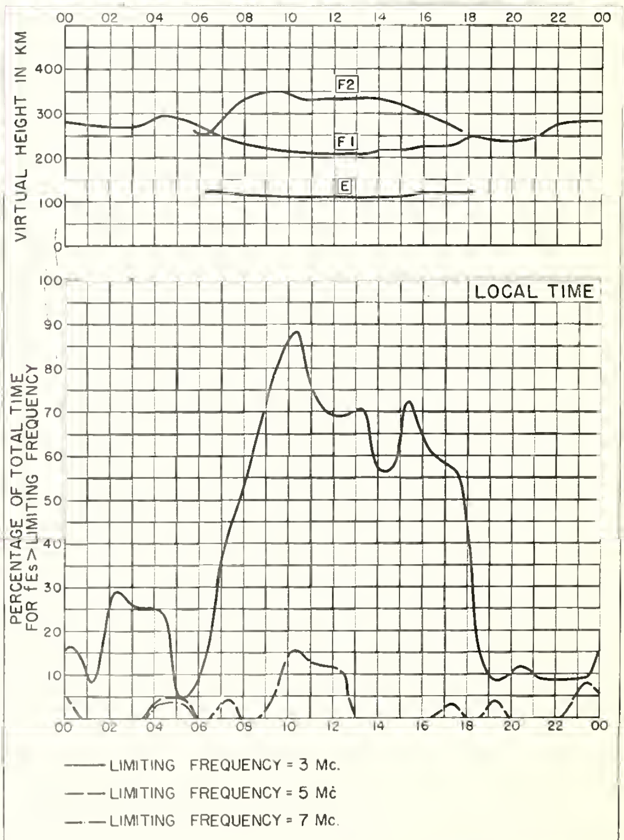


Fig. 48. CAPETOWN, U. OF S. AFRICA FEBRUARY 1951

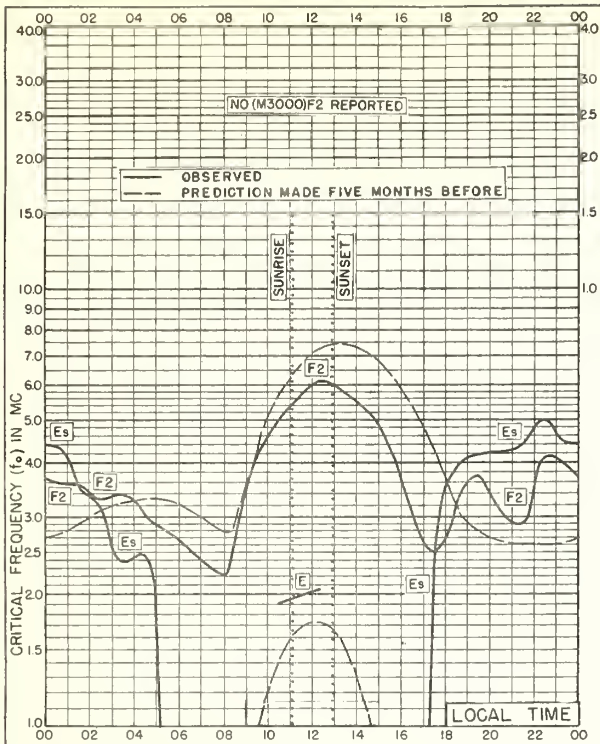


Fig. 49. KIRUNA, SWEDEN
67.8°N, 20.5°E JANUARY 1951

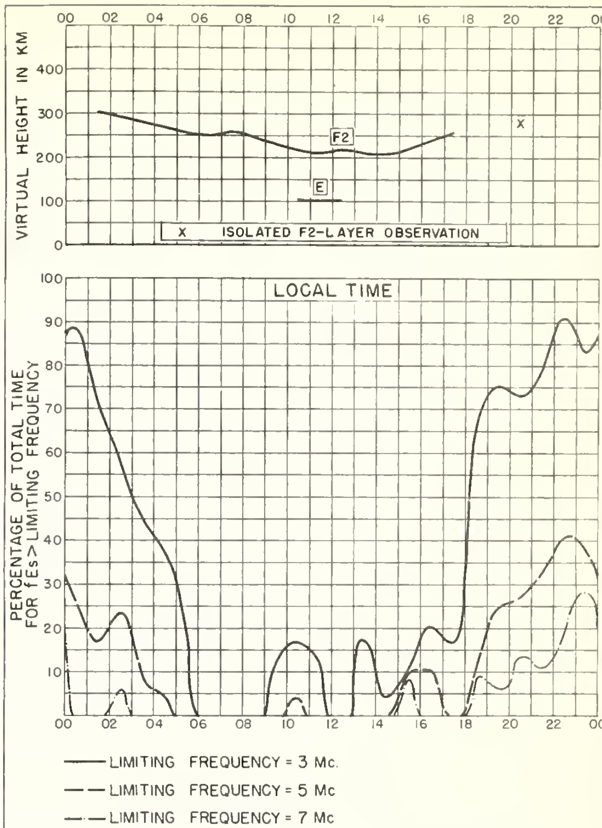


Fig. 50. KIRUNA, SWEDEN JANUARY 1951

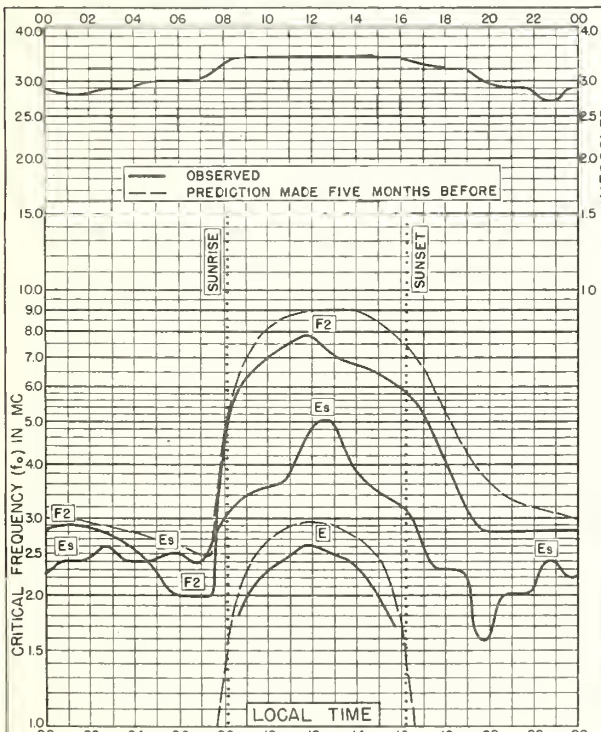


Fig. 51. LINDAU/HARZ, GERMANY
51.6°N, 10.1°E JANUARY 1951

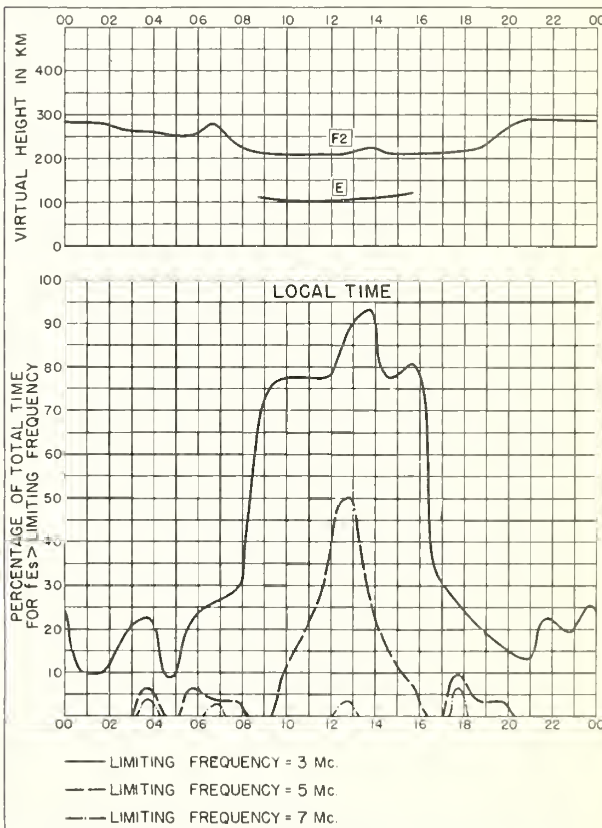


Fig. 52. LINDAU/HARZ, GERMANY JANUARY 1951

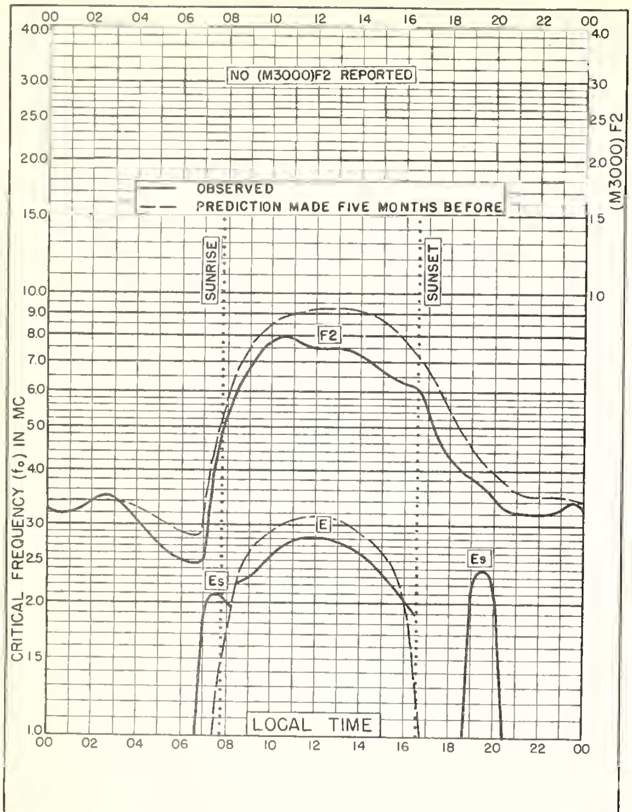


Fig. 53. SCHWARZENBURG, SWITZERLAND
46.8°N, 7.3°E JANUARY 1951

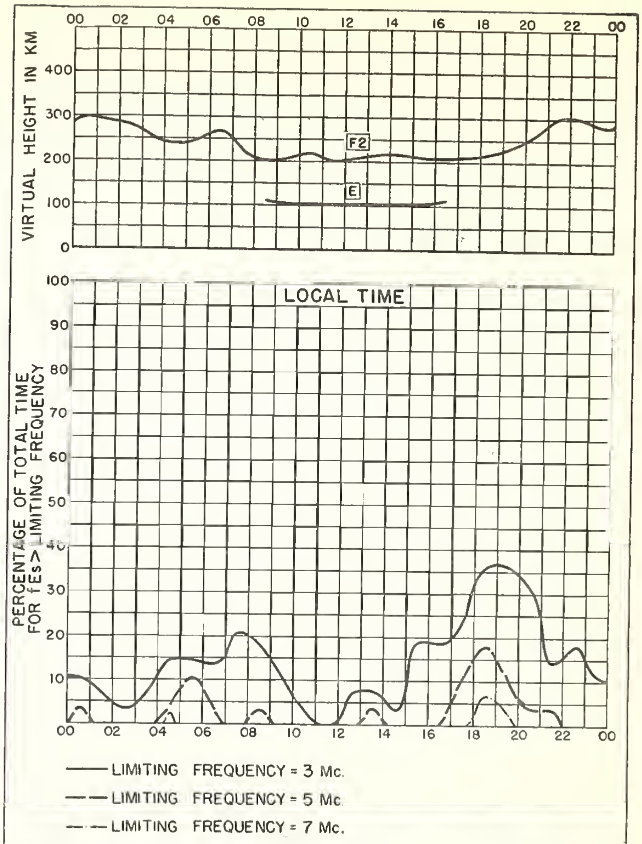
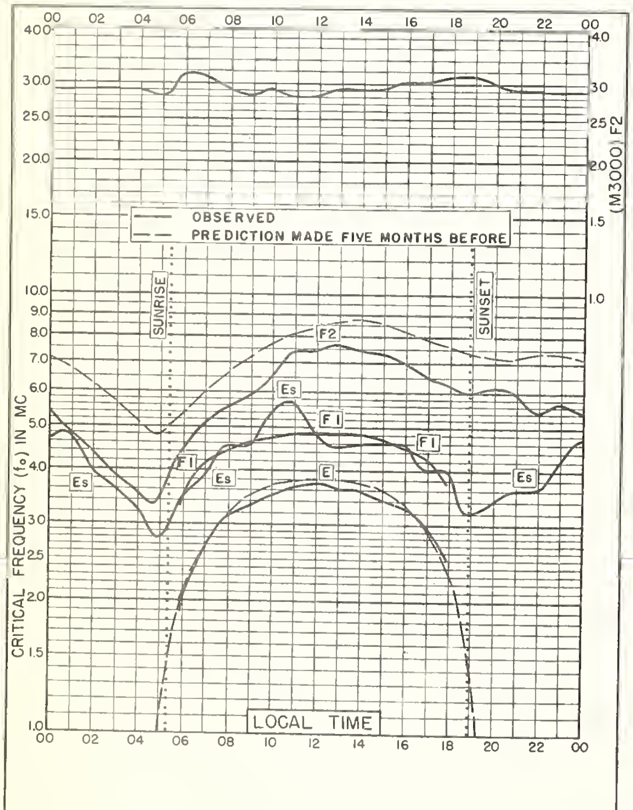


Fig. 54. SCHWARZENBURG, SWITZERLAND JANUARY 1951



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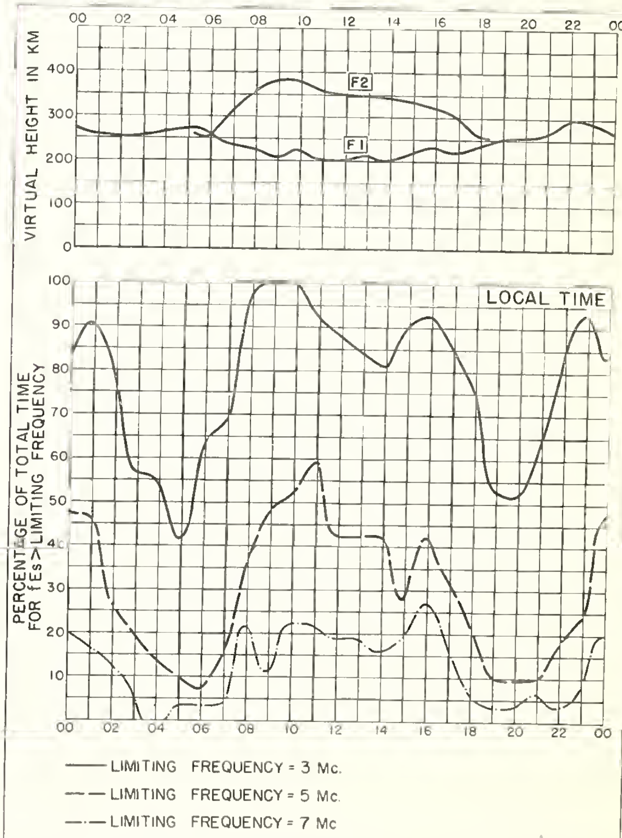

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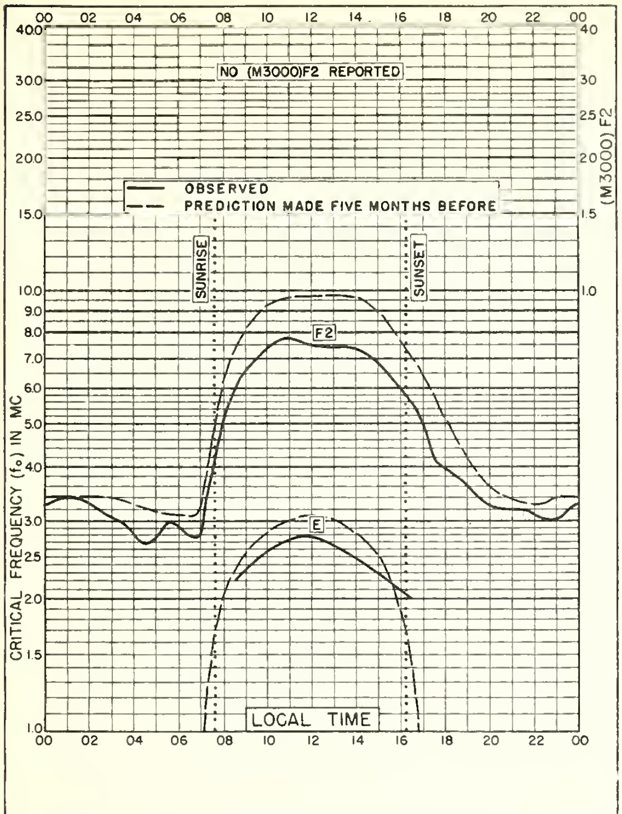

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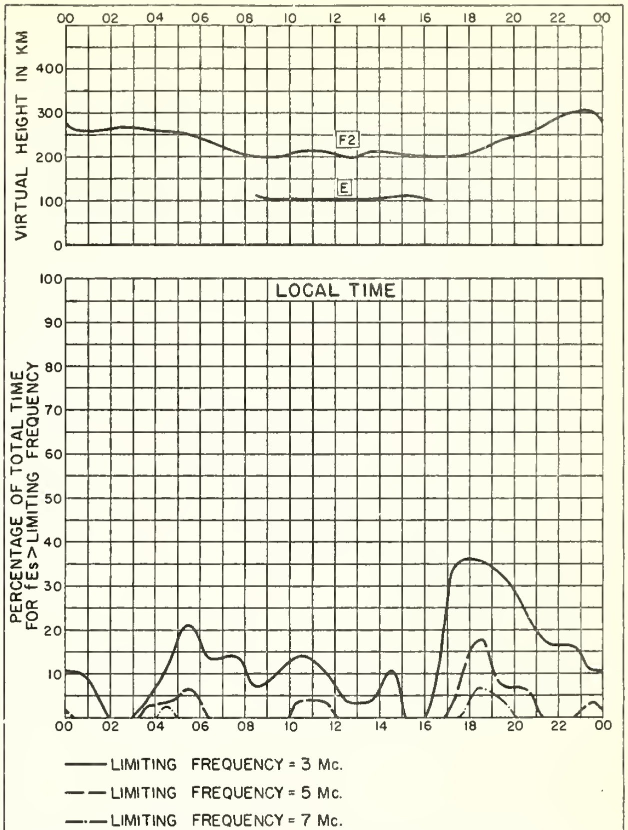

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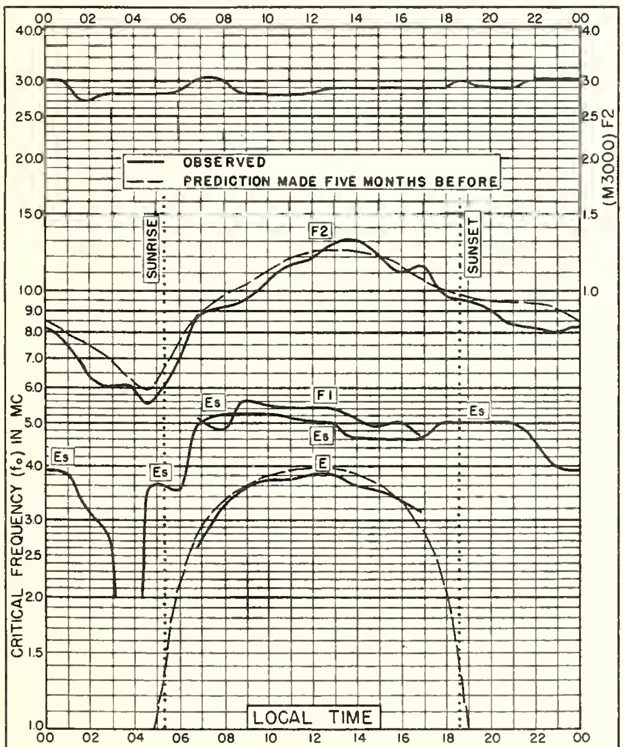

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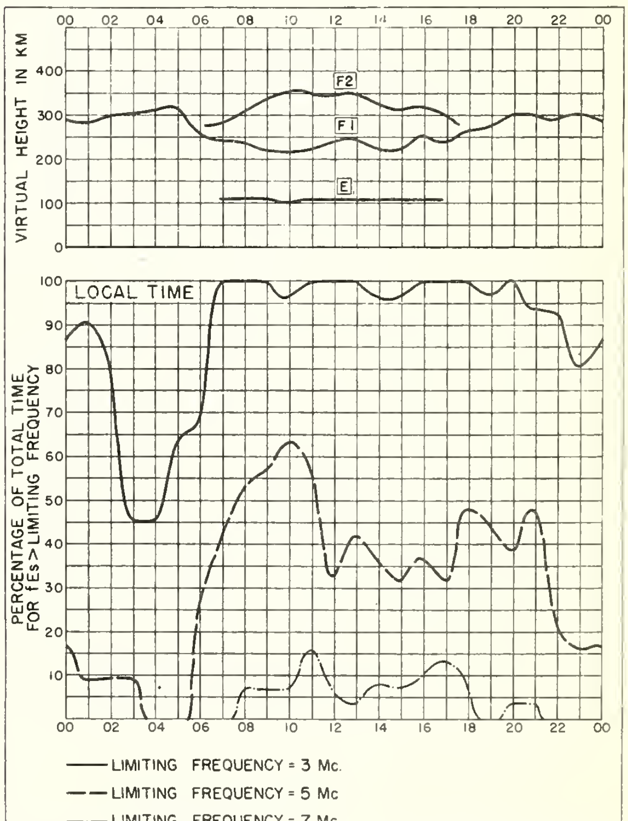

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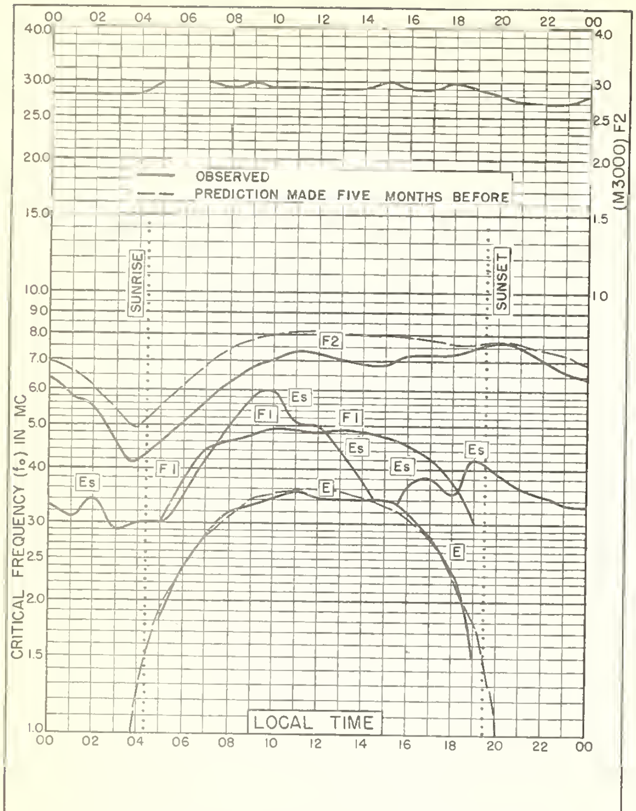

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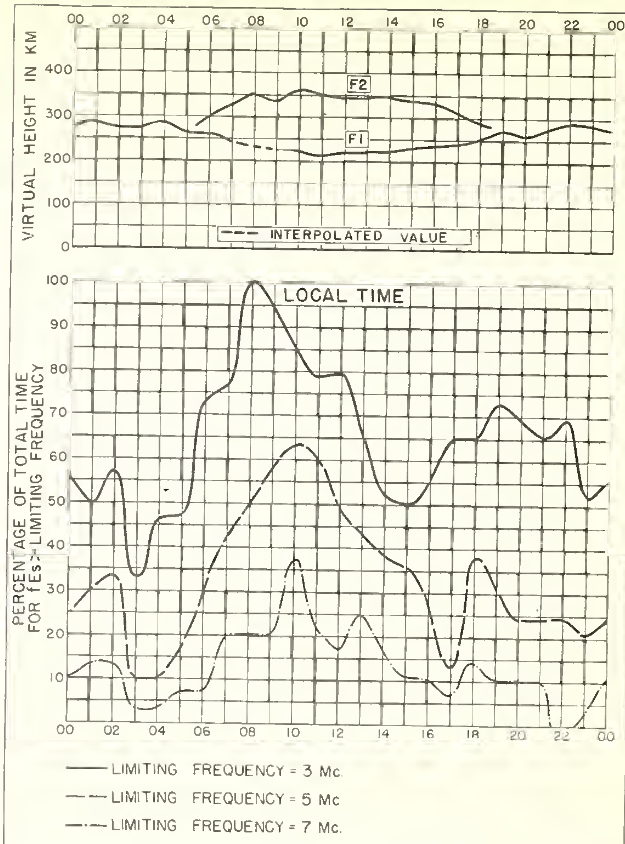

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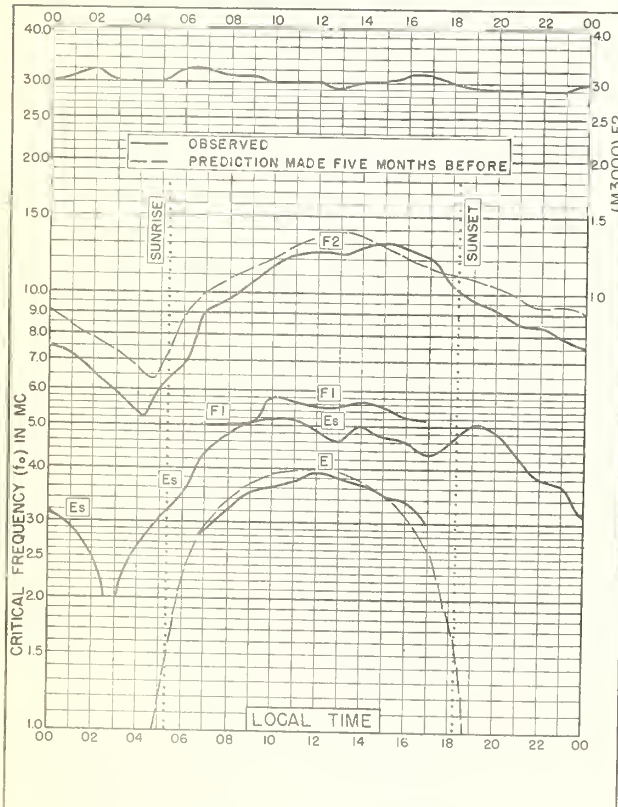

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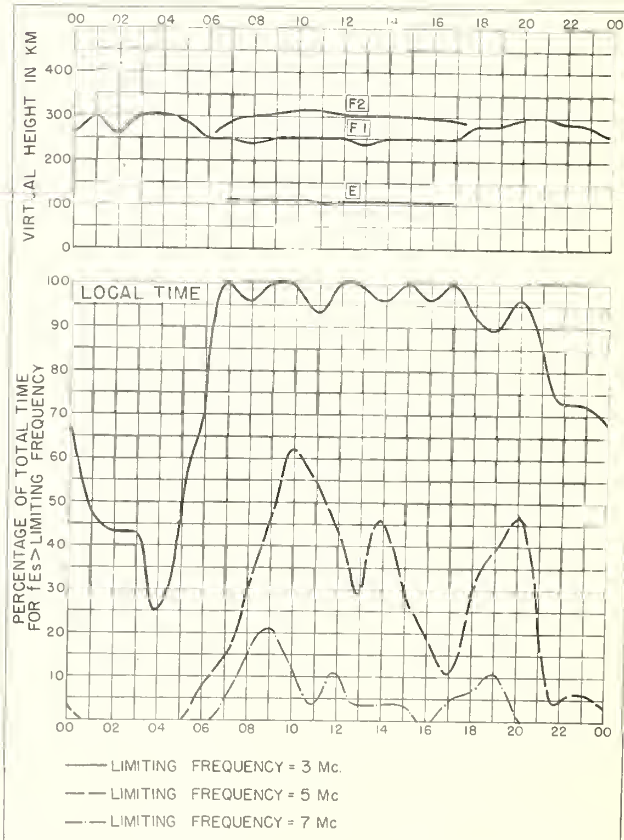

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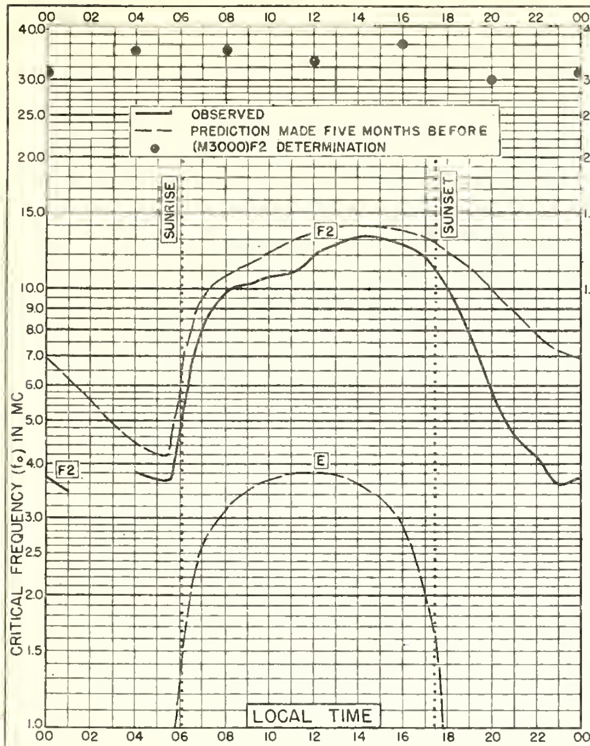

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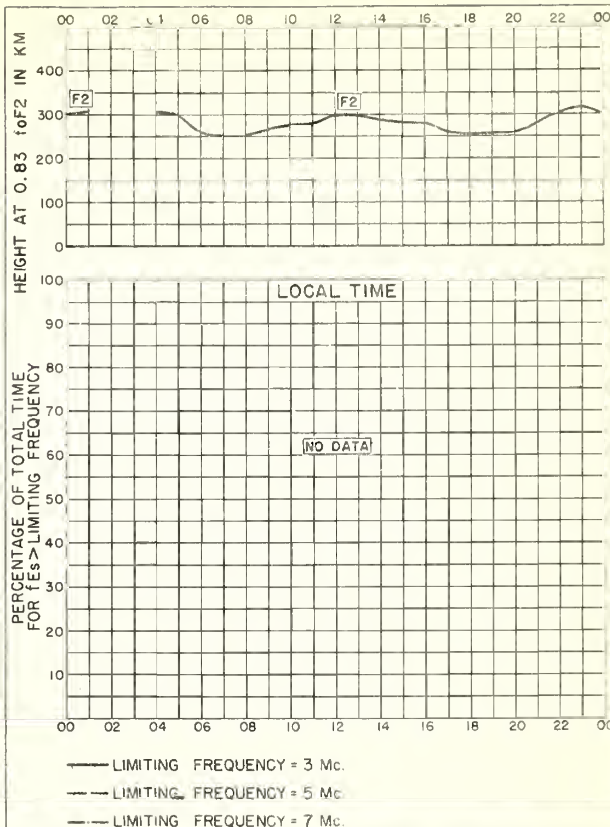

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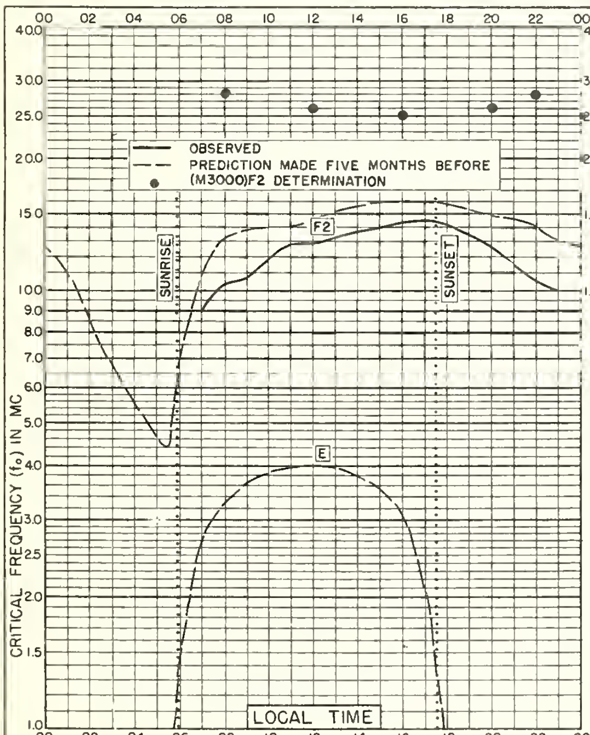

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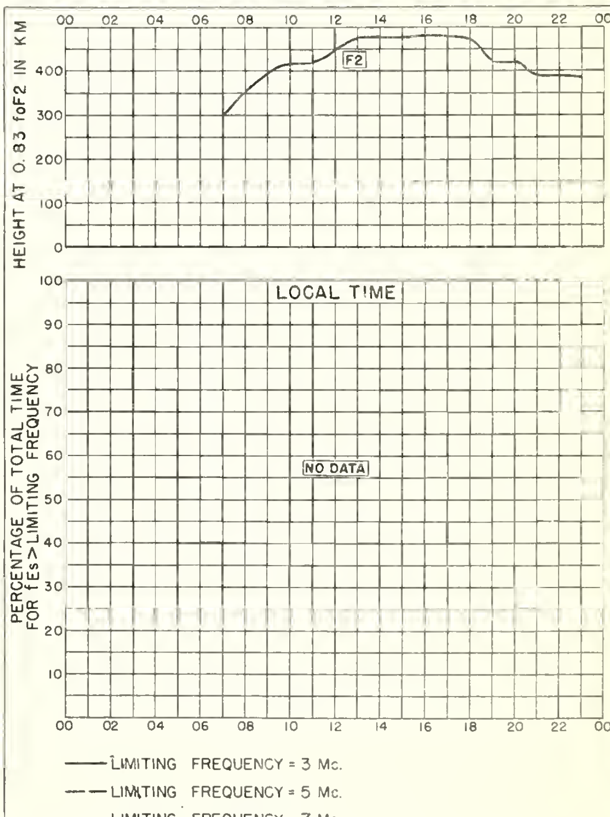

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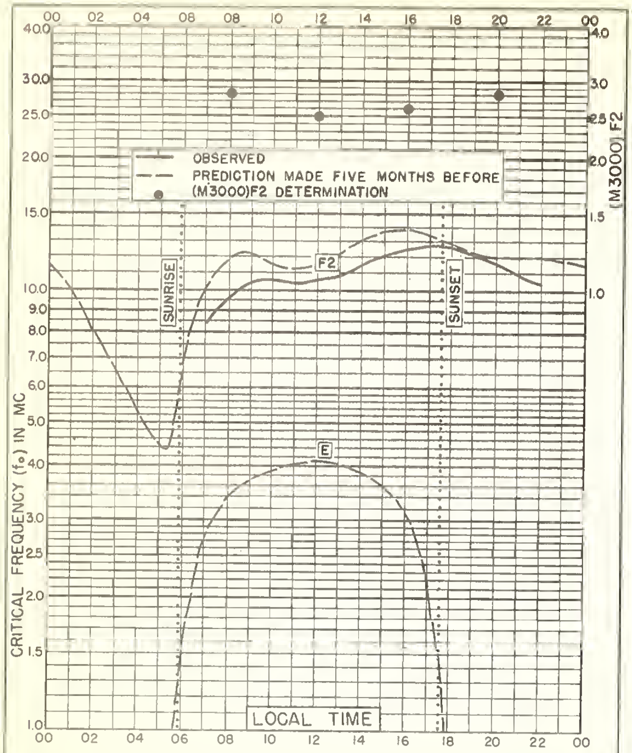

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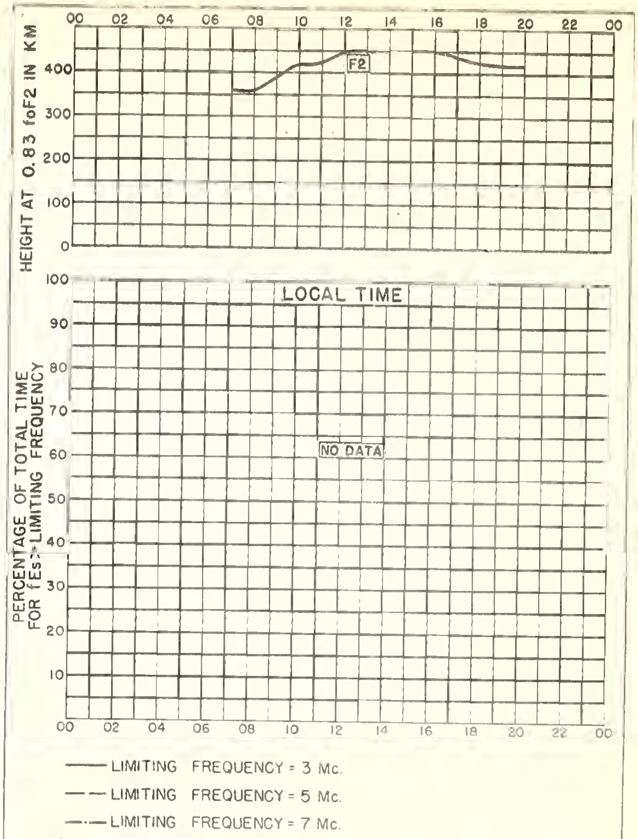

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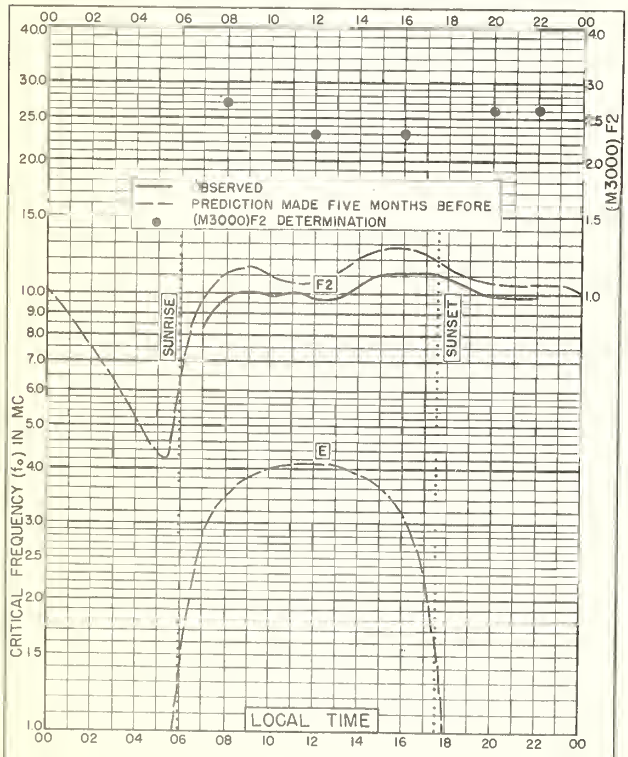

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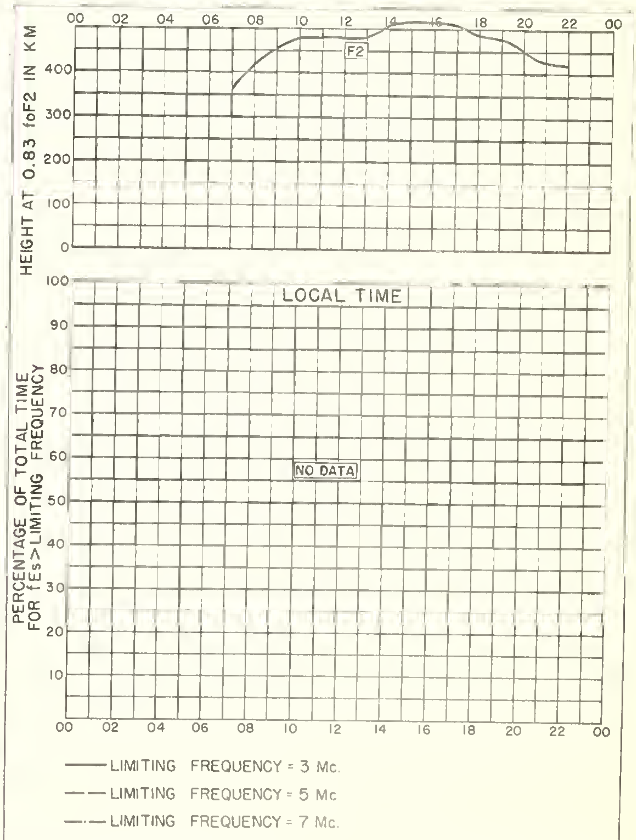

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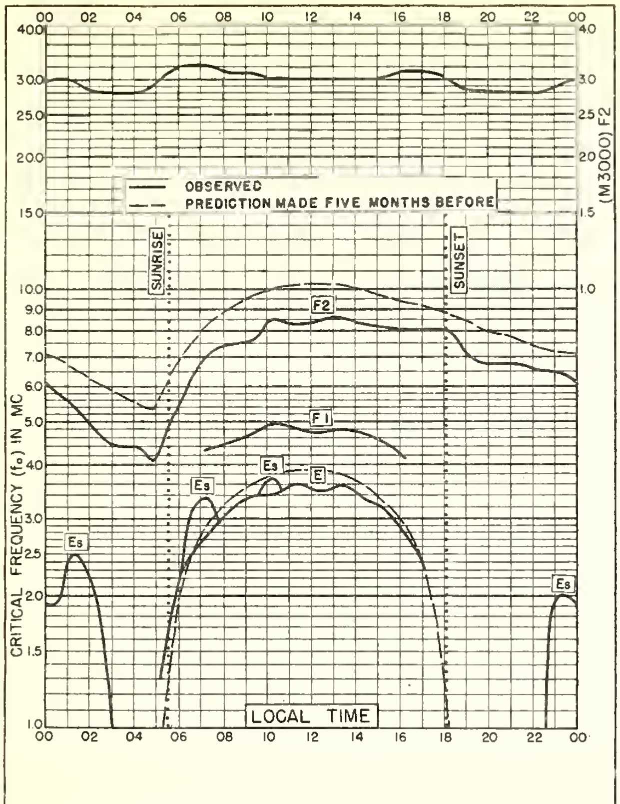

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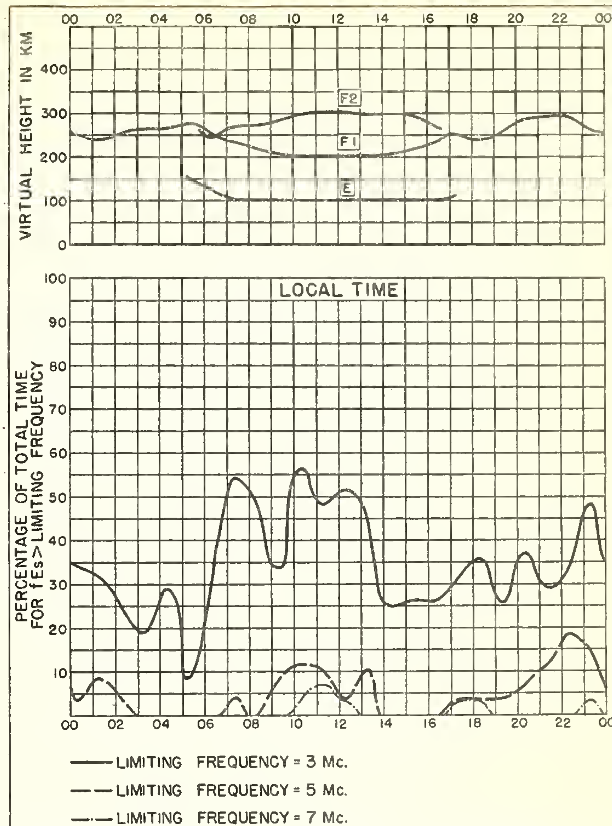

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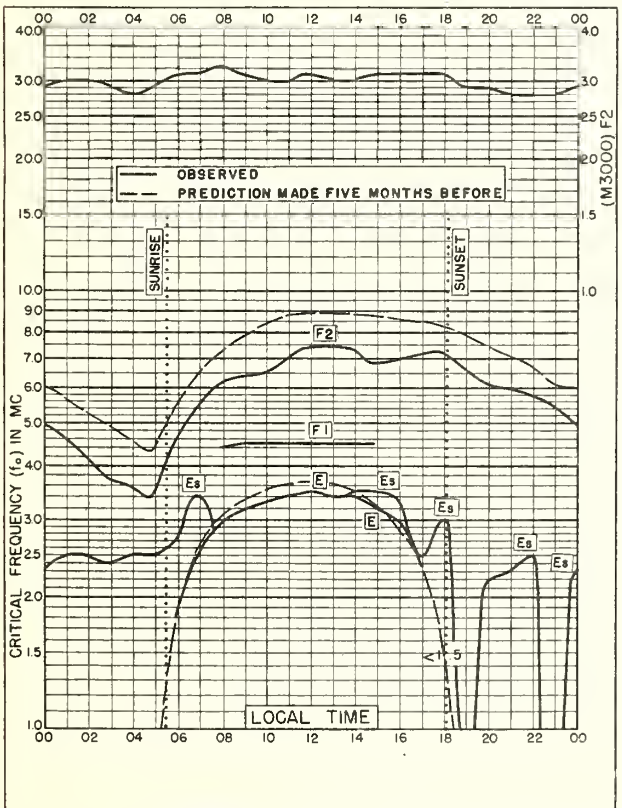

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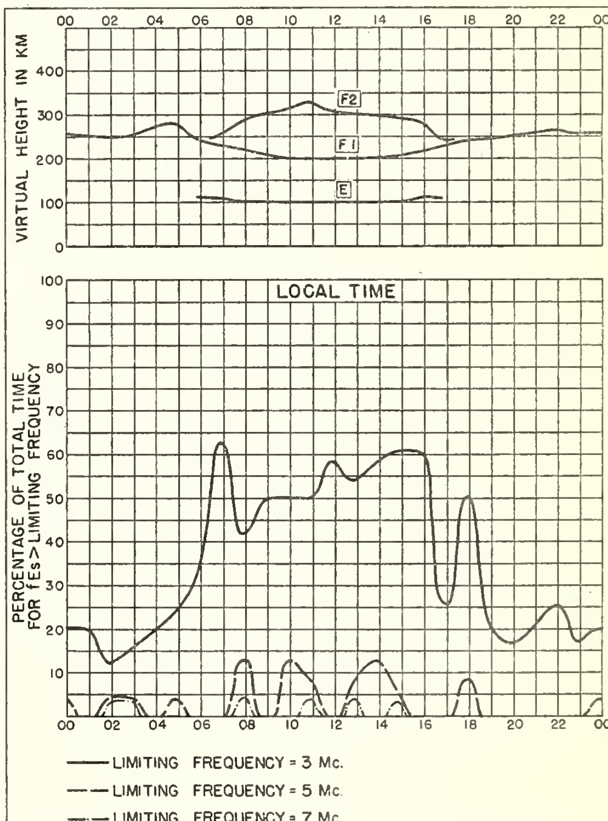

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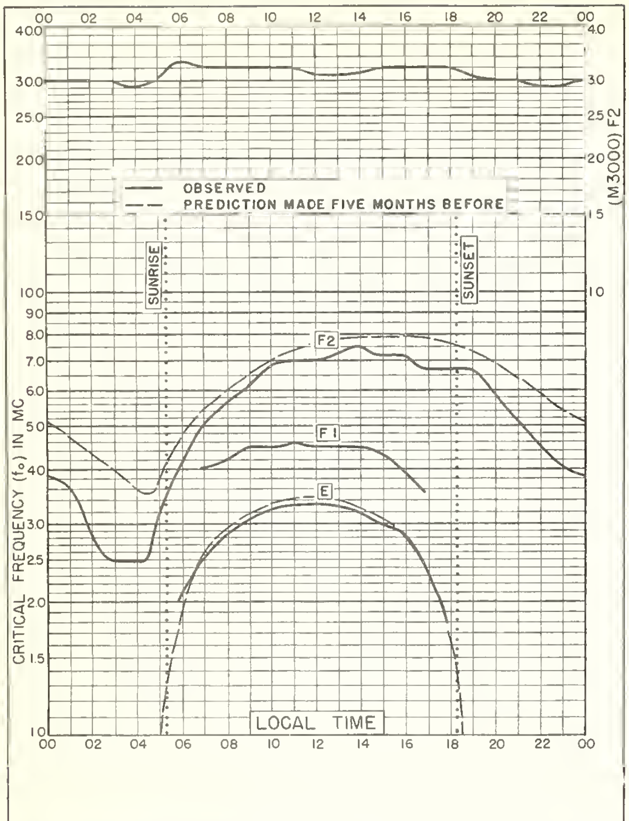

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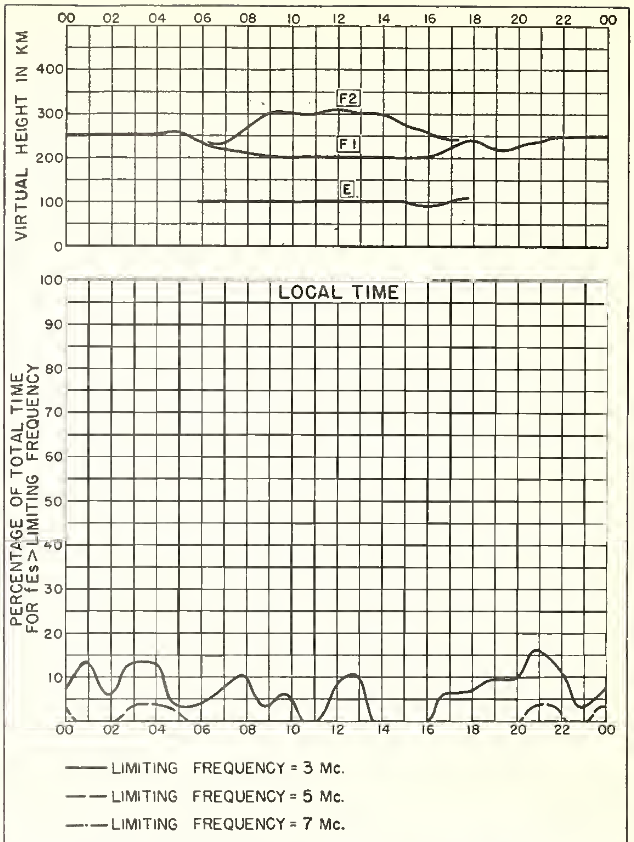

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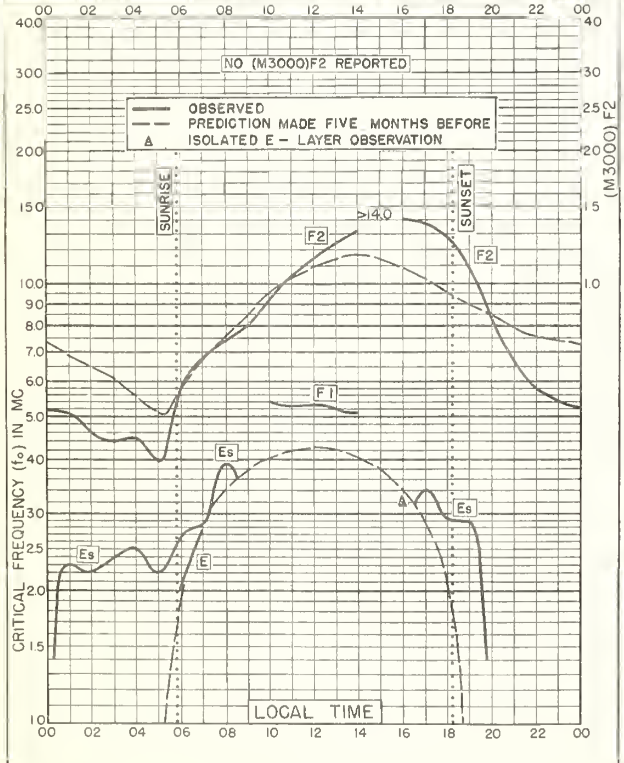

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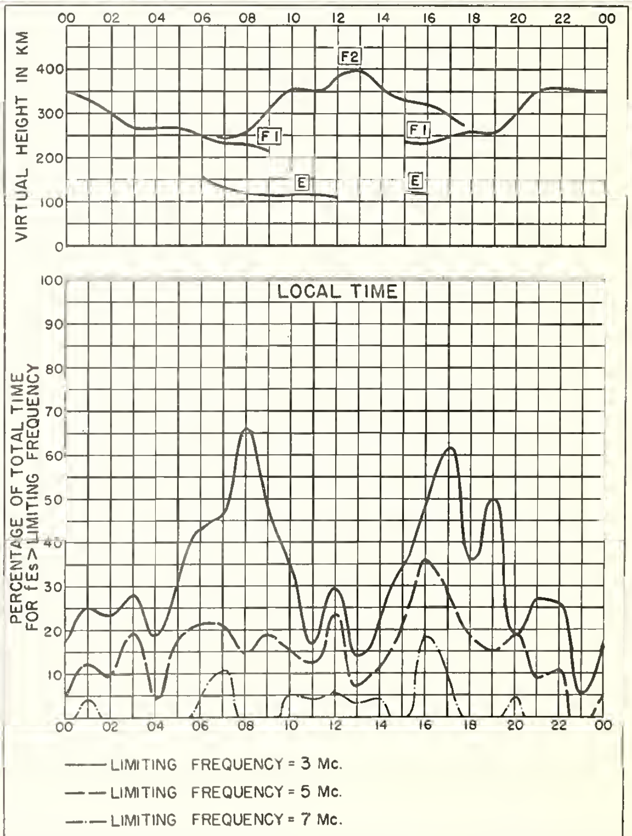

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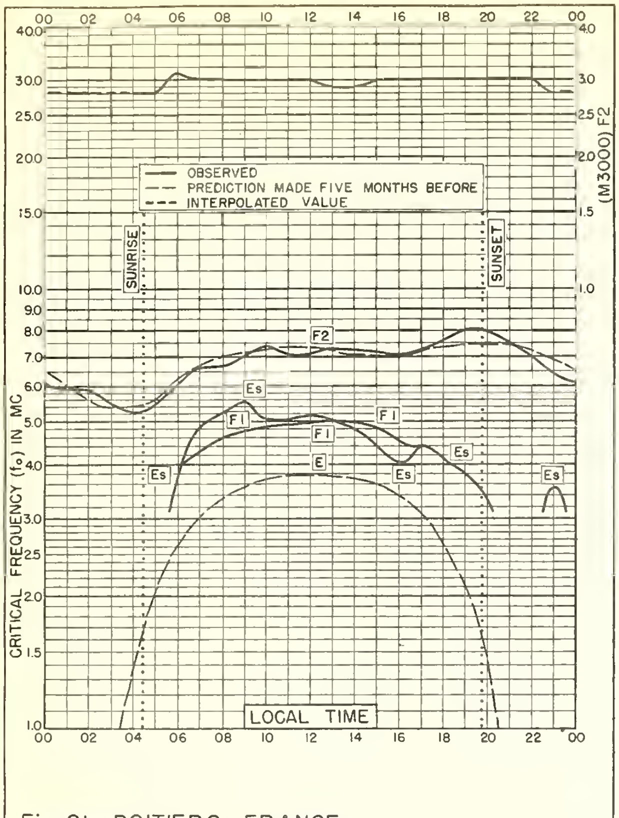

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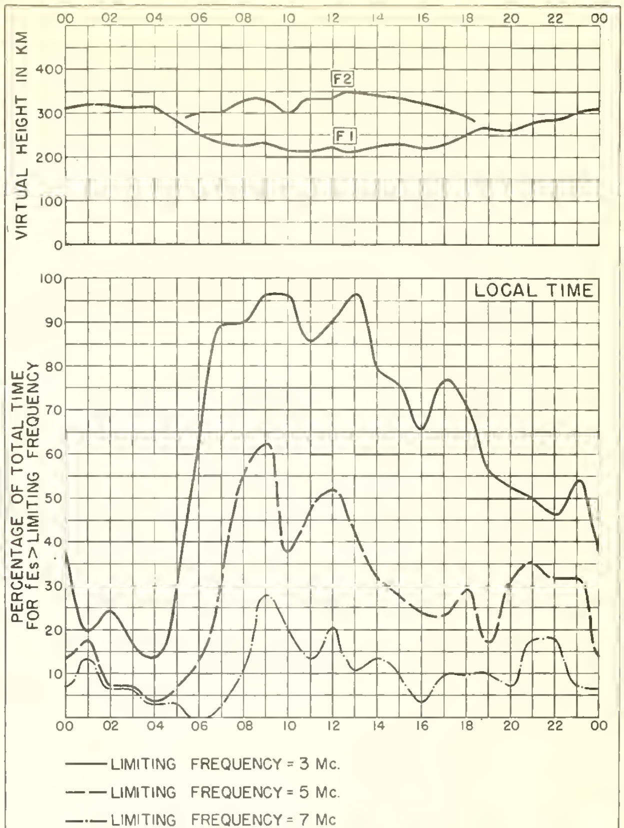

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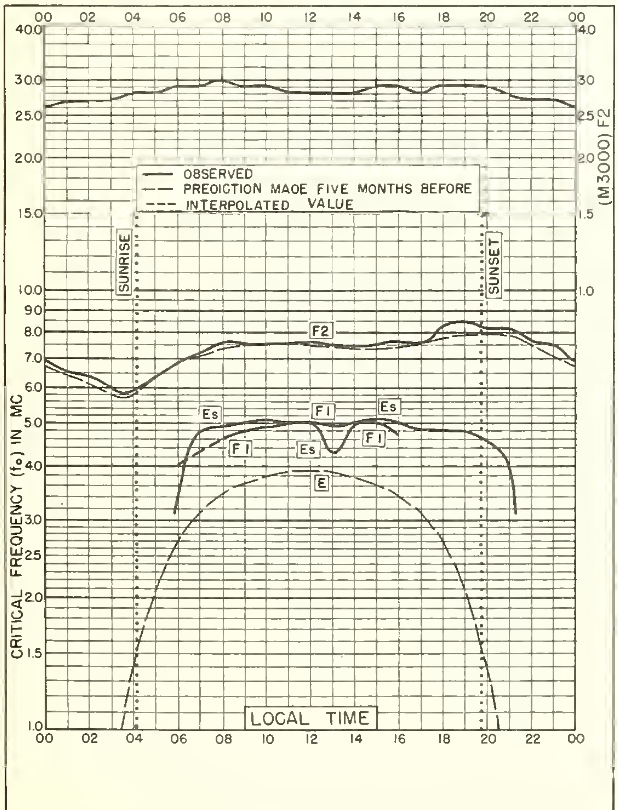

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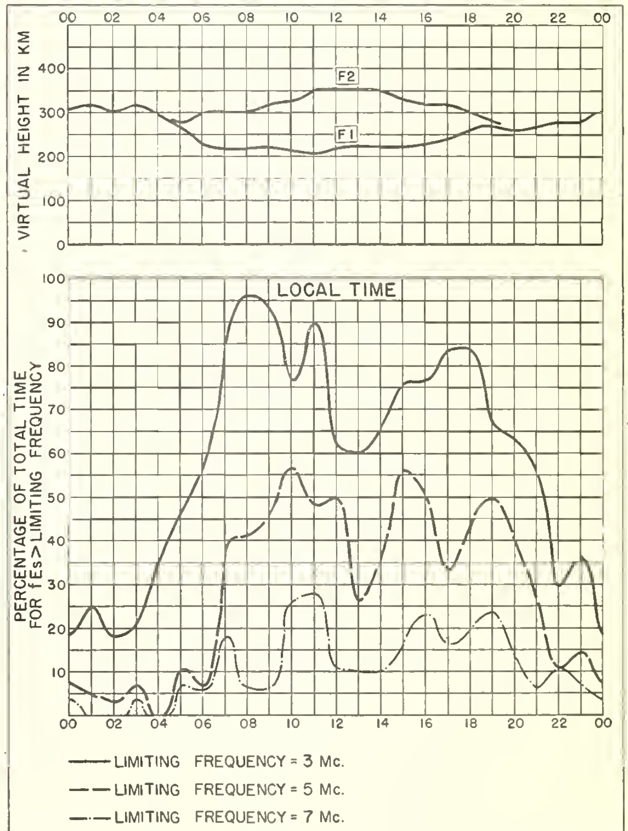

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CRPL–F. Ionospheric Data.
*IRPL–A. Recommended Frequency Bands for Ships and Aircraft in the Atlantic and Pacific.
*IRPL–H. Frequency Guide for Operating Personnel.

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NBS Circular 462. Ionospheric Radio Propagation.
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**R23. Solar-Cycle Data for Correlation with Radio Propagation Phenomena.
**R24. Relations Between Band Width, Pulse Shape and Usefulness of Pulses in the Loran System.
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